

'It's Important to Know In Time'

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The Newspaper of the Industry

Inside Dope

By George F. Taubeneck

How Are We Fixed For Reconversion
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Setting Up Non-Physical 'Reserves' for Postwar Inflation or Deflation?
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How Are We Fixed For Reconversion?

Two opposing sets of omigoddess are now worrying over the refrigeration and air conditioning industry's reconversion problems.

At one pole sits a very small group of men wondering if the industry will have sufficient productive capacity to meet the expected demand for its products. At the other sits a much larger group which fears that we may have far too much productive capacity.

The answer, as we see it, is the flexibility provided by the firms which manufacture the component parts for refrigeration systems. They can contract or expand with far greater ease—to serve the industry's needs—than can the mighty industrial units which turn out complete products ready for the dealers' show windows.

Like the automotive industry, the refrigeration industry has hundreds of "tributary" parts manufacturers. Because these parts makers are traditionally close-tolerance workers, they got into the war business early.

They are the producers of the valves, fittings, heat exchangers, and delicate instruments which have been badly needed for war programs. Some of these smaller firms have expanded from 600% to 1,000%. That expansion will no doubt continue so long as "there's a war on," because demand for these items seems insatiable.

All this increased capacity might appear to the outsider to bode no good for the manufacturers concerned. Actually, as those who follow the pages in AIR CONDITIONING & REFRIGERATION NEWS know, it's lucky that they have been able to expand so greatly. Because the future of the industry knows no bounds.

So Many New Uses Have Developed That Sales Curve Should Rise

So many new industrial uses for refrigeration and air conditioning have been developed for war production that the industry looks forward to a permanent market for its products in industry, to add to its normal market in food preservation and for human comfort.

An enormous export market for refrigerators and air conditioning is expected, as American soldiers spread the gospel of refrigerated foods and comfortable quarters all through the tropic zones. An integral part of every overseas base is big interrelated system of refrigeration units, and portable refrigeration units are unloaded right after the soldiers in every convoy.

In addition, there's the domestic placement market, plus all the new uses now foreseen. So, nobody in the industry seems to be worried by this additional manufacturing capacity. The market for its products should be far beyond anything known before the war.

Hardly an industry you can name—and beyond the automotive—does the future so happily. For many producers, the reconversion problem ranges from the simple to non-existent (several have made

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Air Conditioning & REFRIGERATION

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26-37 Draft Plan Not Likely To Affect Industry

DETROIT—As far as can be determined now, the recent request of James F. Byrnes, Director of War Mobilization and Reconversion, to resume drafting of men in the 26-37 age brackets for the armed forces, will not affect men in the refrigeration field holding occupational deferments.

The communication from Mr. Byrnes to Maj. Gen. Lewis B. Hershey, Director of Selective Service, asked him to amend regulations immediately to provide for the induction of the older men who "are not now contributing to the war effort." Refrigeration engineers and refrigeration service men have long been classified as "critical" workers in an "essential" field of activity.

Those working in such occupations who receive notice that they are up for reclassification should file Form 42-A with their draft boards, certifying that they are at the present working in an essential activity, and requesting that their cases be processed in accordance with the method specified in Selective Service Memorandum 115.

United Buys Midwest's Commercial Interest

GALESBURG, Ill.—Tools, designs, goodwill, and production quotas on the "Midwest" line of commercial refrigerator cabinets have been purchased by United Refrigerator Mfg. Co. of St. Paul from Midwest Mfg. Co. of Galesburg, Ill.

R. S. Wieding, secretary-treasurer of United Refrigerator Mfg. Co. and president of United Refrigerator Sales Co. announced that his company would start production as soon as possible on a new line of reach-in refrigerators, which will follow Midwest styling and construction very closely. United has been in the commercial refrigerator industry nationally with its line of beverage coolers, direct-draw beer coolers, walk-in coolers, and other products.

Midwest Mfg. Co. will retire completely from the field of commercial refrigerator manufacturing. The management announces that it has for some time contemplated devoting more of its plant capacity to the manufacture of utility, kitchen, and wardrobe cabinets. These cabinets will be marketed through department and furniture stores under the name of "Midwest."

McBride Named G-E Range Sales Manager

BRIDGEPORT, Conn. — Appointment of J. F. McBride as sales manager of the range division, effective Jan. 1, 1945, has been announced by General Electric.

Mr. McBride has had extensive experience in the promotion of the company's electric ranges. He joined the appliance and merchandise sales promotion division at Cleveland in 1937 and, at the end of that year, was made advertising supervisor for the range and water heater divisions. In 1939 he was in Minneapolis as range and water heater representative for the west central district.

He was first employed in the International General Electric accounting Section at Schenectady in 1929, transferring to IGE's publicity section in December of the same year.

On Jan. 1, 1933, he joined the publicity department of the company's general office. In 1934 he became an editor of the publicity department.

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Consumers Hard Goods Programs To Be Delayed

WASHINGTON, D. C.—Resumption of production of consumers' durable goods will be delayed "for some time" after Germany's collapse, WPB Chairman J. A. Krug declared at a press conference here last week.

A revised program for reconversion will probably be announced before the beginning of the new year, he indicated. New factors in the war situation, particularly the speeding up of the campaign against Japan, is forcing the reconsideration of plans for reconversion, Mr. Krug declared.

"It should be made clear," the WPB Chairman said, "that WPB has not changed its policy with regard to 'spot authorizations' or reconversion, but is merely adapting the policy to the changes which the quickened tempo of the war, particularly in the Pacific, makes necessary."

Record Crowd of 800 Attends 40th A.S.R.E. Meeting In New York

NEW YORK CITY—All attendance marks for meetings of the American Society of Refrigerating Engineers were shattered as well over 800 members and guests (exclusive of wives) registered for the fortieth annual meeting at the Pennsylvania hotel here this week.

At one session, largely devoted to the subject of "home freezers," there was "standing room only" before the session got underway, and many stood throughout the reading of the papers and the very active debate that followed.

This session revealed that there is

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U. S. Court Won't Set Aside Potter Verdict

CHICAGO—U. S. District Court Judge Walter J. LaBuy on Dec. 11 denied the motion of Stewart-Warner Corp. to set aside verdicts of \$225,000 and \$13,000 damages which had been returned against it by a jury Nov. 22 in a suit by Refrigeration Patents Corp. and Potter Refrigerator Corp. charging infringement of Potter patent 2,056,165 and Potter patent 2,171,712.

At the same time Judge LaBuy denied a motion in favor of Refrigeration Patents Corp. and Potter Refrigerator Corp. to increase the amount of damages awarded by the jury.

WPB Shuffles Heads of Refrigeration Sections

WASHINGTON, D. C. — Recent shifts have been made in the directing personnel of the subdivisions of the War Production Board which are concerned with the administration of various refrigeration priority and limitation orders.

Frank B. Millham is now Assistant Director of the General Industrial Equipment Division, this being the main WPB division under which commercial refrigeration orders are administered.

C. M. Stuart is now Chief of the Special Equipment Branch, and H. A. Edge is Deputy Chief of the Special Equipment Branch.

A. Gordon Wootton is now Chief of the Refrigeration Section of the Special Equipment Branch.

Conservative Terms For Postwar Sales Urged By CRMA

CHICAGO—Adoption of more conservative credit terms—25% minimum down payment and 18 months maximum payment period—was voted by members of the Commercial Refrigerator Manufacturers Association at their recent meeting here.

These terms were proposed by the CRMA postwar planning committee, headed by W. B. McMillan, which conferred with several credit institutions regarding terms for commercial refrigeration equipment. The complete postwar "platform" developed by the committee was also unanimously endorsed.

Terms will not present an important problem in the immediate postwar months, for most buyers will be prepared to pay cash for the first equipment that reaches the market, but when supply catches up with demand, the pressure to liberalize terms will increase, the committee was informed by credit men.

According to the committee's findings, the average retail food merchant not only has his mind made up to completely modernize his store "from front to back" as soon as the materials and equipment become available, but he has the money already set aside for this purpose. Purchase of a new display case,

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Whittingham Shifts To Detroit Gear; Norge Ups Reindel

DETROIT—H. H. Whittingham, formerly vice president in charge of engineering of the Norge and Detroit Gear Aircraft Parts divisions of the Borg-Warner Corp., has been appointed vice president and manager of the latter unit, and Ira H. Reindel, chief engineer for Norge, has been promoted to director of Norge engineering, it is announced by Howard E. Blood, president of the two units.

At the same time, Mr. Blood disclosed that the name of the Detroit Gear Aircraft Parts division will be changed to Detroit Gear division, effective Jan. 1, 1945.

Both Mr. Whittingham and Mr. Reindel have had long periods of service with the Detroit Gear and Norge units, the former having become associated with the Detroit Gear and Norge units, as it was then known, in 1923, and at the same time that Mr. Blood was named general manager of that firm. He held the title of production manager.

Mr. Reindel joined the company in 1925, the first refrigeration engineer employed by Mr. Blood. He was offered the position of chief refrigeration engineer for the purpose of

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Dinegar Heads Division of American Steel Export Co.

NEW YORK CITY—Henry A. Dinegar, who resigned recently as director of the Durable Goods Division of the Office of Civilian Requirements, WPB, has joined the American Steel Export Co. as manager of the Electrical Appliance Division.

Before becoming engaged in government agency work in 1941 Mr. Dinegar was managing director of Carrier Corp.'s affiliate in Europe, Egypt, and the Near East.

Mr. Dinegar was widely known to the refrigeration industry in his work in the OCR, having appeared as a speaker at a number of industry meetings, and conducting meetings of refrigeration groups in the capital.

First Kelvinator Models To Keep Pre-War Design

Mason Tells of Plans In Report To Stockholders

DETROIT—Nash-Kelvinator's first postwar products will be basically the same as the last prewar models, George W. Mason, president, declared in a recent report to stockholders.

"The need for speed in reconversion lies primarily in the responsibility of keeping reconversion unemployment at a minimum," Mr. Mason asserted. "The extent of such unemployment depends largely upon the promptness and thoroughness of reconversion preparations by both government and industry. Permission for pre-conversion activities to take second rank only to war production needs is especially desirable."

"It would also be helpful," Mr. Mason continued, "if government policies were established which would permit early return of specialized war production, particularly in the aircraft field, to those companies normally specializing in the field. This would permit these companies to utilize their facilities fully during the balance of the war, and at the same time free producers of peacetime products to close the reconversion gap quickly."

Deliveries of war products by Nash-Kelvinator Corp. reached a record total of \$274,436,332 in 1944, an increase of \$89,499,970 above 1943, and \$192,374,857 above 1942, but profits decreased, Mr. Mason reported.

Net profit for the year was \$3,065,290 against \$4,115,550 in 1943, Mr. Mason said, with the decrease resulting largely from continually reduced prices to the government for corporation war products, and the rise in income tax rates during 1944. At the same time, after disbursement of \$2,145,794 in dividends for the fiscal year, working capital was increased \$1,769,541 bringing the total to

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W.L.B. Gives Friedrich Okay on Wage Change

SAN ANTONIO, Tex. — Regional war labor board of Dallas, in its first case involving anticipated reconversion to peacetime products, approved new wage rate ranges proposed by Ed Friedrich, Inc., of this city, manufacturer of commercial refrigerators.

The company had applied for approval of ranges to be effective when it re-opened a department which formerly manufactured walk-in coolers. The company was permitted to raise the maximum rates in all of six classifications, and the minimum or hiring rate in three.

"The company could have reverted to the old established ranges without approval of the WLB, but stated that it desired to have the maximums approved higher in order that men could be transferred from war work back to the old jobs without suffering a decrease in wages," declared Regional WLB Chairman Garland Farmer.

Next Locker Convention To Be in Kansas City

DES MOINES, Iowa—Next convention and exhibition of the National Frozen Food Locker Association is scheduled to be held Sept. 24-28 of 1945 at Kansas City, Mo., it has been announced by the main offices of the association here.

Place of the meetings and the exhibits have not been announced.

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Electric Range Sales Simplified By WPB

WASHINGTON, D. C. — Form WPB-1319 may no longer be used to apply for special authorization to sell domestic electric ranges for use by governmental agencies, educational institutions, and service institutions, such as the American Red Cross and the United Service Organizations, the

War Production Board has announced. Under Limitation Order L-23-b, as amended, special authorization to sell electric ranges to such institutions and governmental agencies is no longer required. However, purchasers for these organizations are required to sign and present to dealers the following certificate:

"I certify to the War Production Board and to the seller:

"I own or occupy the premises. . . .
"They have the inside and outside wiring needed for an electric range, and my electric company has told me that electric service for range operation will be supplied. I do not have any electric range for these premises which can be used or repaired."

The same certificate is required to be signed by consumers who wish to purchase ranges for home use. The certificate previously required of such consumers has been broadened to cover educational and service institutions and governmental agencies through substitution of the word "premises" for "residence."

Distributors and dealers previously were prohibited from delivering electric ranges for housing projects if they had not been delivered to them to be sold for that express purpose, unless they were assured of receiving replacements from inventories set aside by manufacturers for distribution to housing projects. This prohibition is no longer in effect.

Applications for production should be filed on forms WPB-3700 and WPB-3820 with WPB field offices, and form WPB-4000 should not be used. Newcomers without previous range production history are permitted to file applications, the decision as to authorization depending upon the possible interference with war production, WPB states.

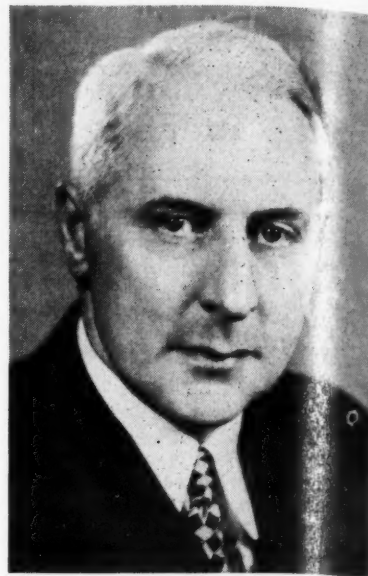
Kelvinator Reports on Postwar Sales Ideas

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\$35,015,684, he reported. Total current assets amounted to \$73,260,776 of which \$35,163,178 is in cash and Government securities.

Nash-Kelvinator produced and recently delivered to the Army Air Forces the first helicopters built under automotive assembly line methods, and quantity production is now under way. The company, which has become one of the world's largest manufacturers of aircraft propellers, produced its 100,000th Hamilton Standard hydromatic propeller unit early in the year.

High-altitude two-stage supercharged 2,000 hp. Pratt & Whitney aircraft engine production continued to increase. Production of propeller-equipped bomb fuses reached peak during the year, and when the contract was completely fulfilled, it was immediately replaced by orders for urgently needed rocket motors of the "Mark 9" type. Diversified output of other war items, including propeller governors, parts for jeeps, tanks and trucks, trailers, ships and submarines, was continued.

Whittingham, Reindel Win Promotions



H. H. WHITTINGHAM



IRA H. REINDEL

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improving the famous "rollator" compressor mechanism.

In 1926, Mr. Whittingham was named manager of sales and engineering for Detroit Gear, and was appointed secretary of the Norge Corp. upon formation of that company in 1927. Subsequent promotions, in the sales and engineering branches, followed coincidentally with the growth of the two organizations until, in 1933, he was appointed vice president of the two divisions, and, in 1938, vice president in charge of engineering of both units.

To Mr. Reindel has been attributed much of the credit for peacetime simplification and refinement of the Norge "rollator" refrigerator compressor mechanism, and wartime development and improvement of fire control gearing apparatus and power-driven machine gun turrets for land vehicles, sea vessels, and aircraft.

Moffats Will Produce Crosley In Canada

CINCINNATI — Peace-time products of The Crosley Corp. will be manufactured, assembled, and distributed in Canada by the firm of Moffats, Ltd., of Weston, Ontario, as the result of a working agreement just consummated between the two companies, it is announced by John W. DeLind, Jr., director of exports of The Crosley Corp.

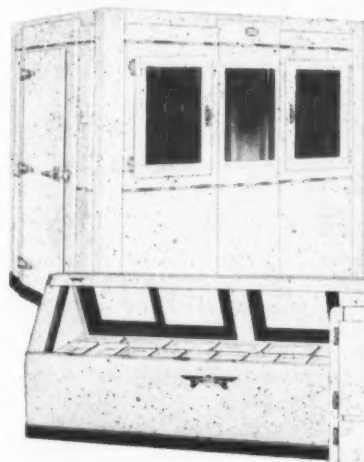
Moffats, Ltd., now under the leadership of Don R. Moffat, vice-president and general manager, is one of Canada's oldest organizations and one of its largest peace-time manufacturers of stoves.

Various parts of the Crosley Shelvador refrigerators, home radio receivers, and other Crosley products will be imported by Moffats from the main Crosley plants in Cincinnati and in Richmond, Ind., to be incorporated into the Crosley radios and major appliances which will be manufactured in Canada.

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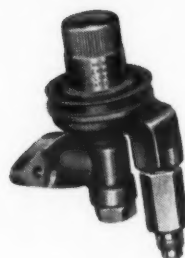


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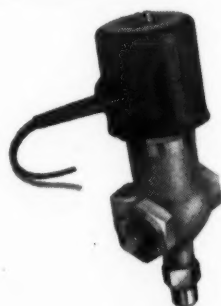
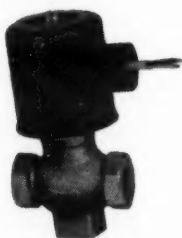
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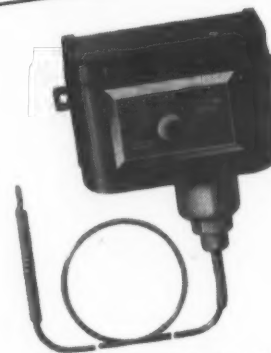
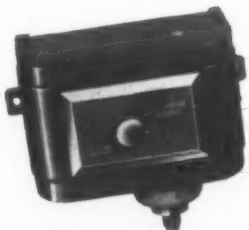
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Inside Dope

By George F. Taubeneck

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nothing else for the armed forces but refrigeration and air conditioning equipment). Moreover, few industries are so favorably confronted with an assured market for their products.

For the Vice President in Charge of Postwar Planning, in this industry, there are but two hyphenated problems: design-and-production, and marketing-and-consumption.

Solution to the first hyphenated problem is already far ahead of schedule, thanks to war orders and war-accelerated research. Second is simple insofar as consumption goes, because of the known postponed demand.

Marketing studies are not quite so simple. They require thought and judgment. But they are being made. Witness, for example, this publication.

Product research has high priority in any industry today, but in few industries are the lines-of-search so well defined.

Industrially, the war has unearthed so many uses that we'll be years and years catching up with the significance, and the fruition, of all now indicated.

Commercially, the industry seems to be swept up in a tide—or rather, a current—of faster running demand for frozen foods, a demand which will make coming commercial refrigera-

tion equipment volume vastly in excess of anything known before.

(In commercial refrigeration, it should be noted, this swelling stream of demand cannot be depended upon to provide automatic prosperity for every producer. On the contrary, hungry newcomers can be expected to be eating away at the volume voraciously, if they are not checkmated by adequate research and developmental efforts—plus the strongest sort of promotion and merchandising—on the part of established manufacturers. This will be a "tough league.")

As for air conditioning, low-temperature refrigeration, new types of refrigeration equipment (notably hospital refrigeration), specialty major appliances, and totally new "better living" products, market and merchandising research and preparation must be intensified and invested in to an extraordinary degree.

Setting Up Non-Physical 'Reserves' for Postwar

"Reserves" in market and merchandising research are now being set up, conscientiously, by the experienced prospective manufacturers of such lines, just as cash reserves are normally set aside on soundly managed corporate balance sheets. These "reserves" be it noted parenthetically, are being acquired at

the greatest bargain sale in modern history.

Inventories of new ideas—plus both use and distributive tests of those new ideas—are the only inventories worth keeping today (outside of personnel inventories, of course). Just as canny manufacturers at the beginning of the war loaded up on raw materials and tools, today they are loading up on new ideas and research.

Among the types of research currently allocated for are studies into economic and social forces which will make themselves felt—not only in this nation, but in the world—tomorrow. Research today goes far beyond engineering, or marketing, or promotion. It invades the sphere of the far-from-congealed social sciences.

Inflation or Deflation?

A general economic collapse following a sudden end to the war is not to be laughed off as a pipe-dream. It could happen. Most men in this industry believe "it can't happen here," recalling that this industry resisted the world-wide depression forces in the 1930's probably better than any other segment of our industrial empire, and realizing that our growth potential is so tremendous that normal workings of the economic system cannot be expected to stop it.

However, economic and social situation can retard the tremendous growth we are entitled to and so confidently expect. So the wisest manufacturers are encharging their public relations directors with the responsibility of continuously feeling the public pulse. They under-

stand that if the free enterprise system fails, so do they—notwithstanding the world's urgent need for their products.

Not alone is it necessary that we provide increased employment whilst serving the public with goods provided for its pent-up needs and demands. No longer is it sufficient that we provide the people with better and better products—in regard to convenience and economy—at lower and easier prices. No longer is it solely essential that we simplify and standardize, enhance consumer appeal, and broaden the market base of our products.

We must, in addition, raise the standards of living so profoundly that not only will the free enterprise system as we know it be approved and upheld by American voters, but that our groaningly superimposed tax burden will be accommodated, and the rest of the world will be so impressed that democratic free enterprise (which means peace and prosperity for all) must become the goal for all nations.

Procedure for Manufacturers

The smart manufacturer will begin by checking up on the patent validity of both his own situation and that of his competitors. He will next restudy his plant location with regard to after-war possibilities in transportation costs (paying especial note to air transport facilities).

He will next check all probable new uses for old products, and all possible new uses for new products his engineers say he can make. He will worry loud and long over proposed selling prices, viewing labor costs with alarm, and estimated postwar incomes with jaundiced eye.

He will give another look at his old competitors, and those possible newcomers—as far as the prewar market goes. And if he intends to invade a new field, he'll give more than a cursory glance toward the competitive line-up he plans to bust into on "a wing and a prayer."

He will take long and careful note of the surplus equipment which may overhand his markets. He will also consider his saturation factors.

In the distribution field, he will make authoritative inquiries into how well the previous distributor-dealer set-up has served the industry, consulting fresh opinion as to the type of sales organization which can best be expected to move his product in the volume his factory will require.

He will further inquire into the expense-to-sales ratio to be expected, into the advertising and promotional budget needed, and into the costs of

servicing his products satisfactorily and nationally.

Will he place his future in the hands of proved and accredited independent distributing and servicing organizations? Or will he try to attain further control over these close-to-the-consumer operations? How will he plan to cope with warehousing, parts stocking, and delivery problems? Will these latter considerations affect his design and pricing decisions?

Nearly all of these questions answer themselves, in a way. They call for daring cerebration, for departure from custom, for virile thinking in terms of new materials, new methods, new marketing procedures, and better directed promotion. ("Scatter-gun promotion" has passed its time of economic usefulness.)

Established manufacturers can bank on it that the newcomers will be trying something new. They can also probably depend on the newcomers making many mistakes out of incompetence and inexperience.

But audacity should never be confused with incompetence. Audacity often pays off. And new times demand fresh thinking.

'We Are Fighting Three Wars'—Ruthenburg

Louis Ruthenburg, president of Servel, has made the point that the people of the United States must win three wars—one against Germany, another against Japan, and a third against low postwar levels of productivity and employment at home. Loss of the third war might result in losing all for which we have fought the first two wars. That would be the most ironic and tragic event in the history of mankind.

These wars cannot be fought in orderly sequence. Even as the war in Europe approaches its climax and as action in the Pacific is accelerated, we face the initial engagements of the third war.

American business management generally recognizes the need for establishing high levels of productivity and employment as quickly as may be possible in the postwar period. This objective is second only in importance to winning the wars against Germany and Japan.

Moreover, the importance of maintaining an economy of plenty without disastrous fluctuations in the postwar years is generally recognized as a vitally important long range objective.

To sustain such a healthy postwar economy, low costs, low prices, high values are essential. These postwar problems must be approached immediately, boldly, and comprehensively.

Control Problems Wanted!

Right Now—Minneapolis-Honeywell refrigeration engineers are ready to help you with any problem involving refrigeration equipment control. Our engineering experience and research facilities are available to assist you in the design or application of controls to your own postwar products. Make use of this service—there is no obligation. Minneapolis-Honeywell Regulator Company, 2807 Fourth Avenue South, Minneapolis 8, Minnesota. Branches and distributors in principal cities.

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WEST NORFOLK, VIRGINIA

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131 State St., Boston 4

New Food Freezing Plant Placed in Center of Area Specializing in Lima Beans

Semi-Automatic Conveyor System to Freeze More Than a Million Pounds Annually

ELLENDALE, Del.—A new fast freezer which delivers 6,000 pounds of fresh produce an hour is now at work in the food processing plant of John S. Isaacs & Sons and will be used to quick freeze annually more than a million and a half pounds of lima beans alone in this center of U. S. lima bean growing.

The fast freezer, developed as part of a new line of such equipment for producers by the York Corp., is installed in a new four-story food storage plant whose refrigeration was also supplied by York. The freezer will eventually handle the yield from a million pounds of lima beans planted each year by Mr. Isaacs on his 7,000 acres of farmland.

WILL HANDLE POULTRY

In addition to handling other truck produce from the Isaacs farms, the freezer will handle a large portion of the poultry raised on the Isaacs land and sold to independent packers. An average of 300,000 chickens are kept by the Isaacs company for the produce market. To feed them, 1,000 acres of corn is grown on the land each year.

When completed, the cold storage plant in which the freezer operates will hold 200 carloads of frozen food and most of this space will ultimately be used to store frozen products before they are released to the market. Refrigerated rooms already completed are now used to hold approximately 50 carloads of frozen produce for the Army. Until war needs are satisfied, new rooms will be turned over to Army storage as they are completed.

Combined, the present fast freezer and compressors supplying the storage rooms have a refrigeration capacity of 110 tons. The rooms, 12 of them in all, are kept at temperatures ranging from -20° F. to 10° F.

PREPARING DONE ELSEWHERE

The building will be used only for the actual freezing and storage of the vegetables and poultry. The preparation of the products, including shelling and cleaning of vegetables, blanching, and dipping is done in a separate building 10 miles away. The processed food is then trucked in. In addition to lima beans, other quick frozen products will include asparagus, peas, and squash.

The installation at the Isaacs company includes the larger of the two new models of York fast freezers. It is capable of holding 10 food trucks at a time in various stages of the freezing operation. Semi-automatic in operation, the freezer operates by means of a conveyor which moves the truck through the freezing compartments. The first

truck is pushed into the precooling chamber by hand and then moves forward automatically as the conveyor control button is pushed. Trucks are removed by hand at the end of the process.

One of the features of the new freezer is its rapid defrosting equipment which permits a minimum of production interruption and immediate resumption of peak production the instant frost is removed from the cooling coils. The design also makes it possible to incorporate two or more machines into a single unit to conform to individual plant layouts. Two freezers can be operated side by side to provide a parallel production line for freezing both loose and packaged products.

J. J. Anderson Promoted By Westinghouse

NEW YORK CITY—Appointment of J. J. Anderson as eastern district supervisor of the Refrigeration Specialties Department of the Westinghouse Electric & Mfg. Co. has been announced by W. H. Loeber, eastern district manager of the Electric Appliance Division of Westinghouse. Mr. Anderson is located at the company's eastern district headquarters at 40 Wall St. in New York.

Mr. Anderson has been with Westinghouse since 1937. Since completion of the company student training course, he has served as air conditioning supervisor in the central district and during the period from 1941 to 1944, has been in the War Products Department of the company.

In his new capacity, Mr. Anderson will be responsible for the sale of the products of the Refrigeration Specialties Department in the entire eastern district, comprising the New England States, New York State, and Northern New Jersey.

Art Roy Advanced In WPB Consumer Branch

WASHINGTON, D. C.—Arthur C. Roy, at one time advertising and sales promotion manager for General Electric Air Conditioning Department, Bloomfield, N. J., has been named assistant to Stanley B. Adams, director of the Consumers Durable Goods Division of the War Production Board. He succeeds George D. Morton.

Mr. Roy had been chief of the Lamp and Battery Section, Electric Goods Branch of WPB, and for four years prior to joining WPB was assistant to the president of the Quaker Mfg. Co., Chicago.

McCray Advertising Account To McCann-Erickson

CHICAGO — McCray Refrigerator Co. of Kendallville, Ind., manufacturer of commercial refrigerators, has appointed McCann-Erickson, Inc., Chicago, to handle its advertising effective Jan. 1, 1945.

Air Devices Elects 3 New Officers

NEW YORK CITY—Air Devices, Inc. has elected three new officers, with C. N. O'Day, one of the company's founders and previously its treasurer, assuming the presidency of the firm.

Gerald F. Mannion becomes vice president, and George J. Sweeney is the new treasurer.

The reorganization is occasioned by the retirement of the former president, Jack Spalding, Jr., from the company to devote his full time to the development of food dehydration.

Mr. O'Day has been associated with the heating and ventilating field for 30 years. He previously was designer, chief engineer, and sales manager of the Buckeye Blower Co.

He also was connected with the eastern sales division of Barber-Colman Co. prior to his joining Mr. Spalding in the founding of Air Devices, Inc. in 1939.

Kerotest

The patented* Kerotest Diaphragm Packless Valve is but one of the many important contributions made by Kerotest research and engineering towards more dependable, economical Air Conditioning and Refrigeration. Descriptive bulletins sent on request.

* U.S. Patents Nos. 1,890,505—2,061,028. Swiss Patent No. 181,883. Canada Patent No. 340,598. Listed standard by Underwriters Laboratories.

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Valves • Fittings • Accessories
PITTSBURGH, PA.



NATIONALLY ENDORSED

Pad is adjustable to all makes and sizes of refrigerator cabinets; thoroughly protects finish of cabinet from scratches and marks during moving; easily and quickly put on or off; sturdy, lasting construction; easily pays for itself in a short time. Price \$11.75 each.

Attractive lettering of your name on pad at \$2.00 each extra.

For carrying your refrigerator more safely and easily, use the Mastercraft Adjustable Carrying Harness which is a separate unit from the pad and priced at \$8.50 each.

Write for complete folder and prices on pads for refrigerators, washers, ironers, ranges, radios; also furniture pads and protective covers. . . . All prices subject to change without notice.

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Incorporated 1921

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Superior QUALITY FITTINGS

...designed especially for use in refrigerating systems where they must withstand wide fluctuations in temperature, plus considerable vibration. Machined from brass forgings and considerable extruded brass rod to assure uniform density—maximum strength—freedom from season cracking—total absence of seepage leaks.

All threads machined to medium fit (SAE Class 3). Flare threads and faces protected by cardboard ferrules.

SUPERIOR QUALITY FITTINGS are recommended for, and used extensively by refrigeration, machine tool, marine, refining, liquefied petroleum gas, and many other industries.

SUPERIOR FITTINGS SPECIFICATIONS

Size	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"	12"
Weight	0.10	0.15	0.25	0.40	0.60	1.00	1.50	2.00	3.00	4.50	7.00	11.00	18.00	28.00	42.00	60.00
Length	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00	8.50

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'Self-Service Super-Markets Hold the Key To Postwar Distribution of Frozen Foods'

Bess, N.Y.C. Locker Pioneer, Installing 'Frozen Food Center'

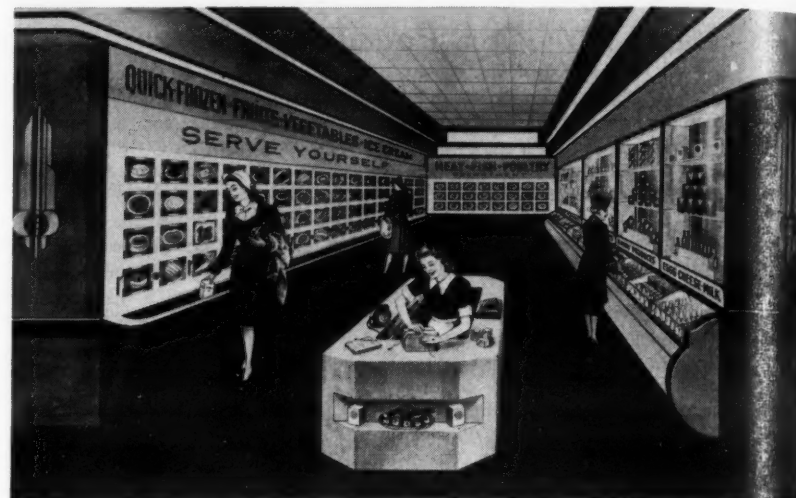
NEW YORK CITY — "Super-markets hold the key to postwar distribution of frozen foods."

That's the opinion of John Bess, president of Refrigeration Corp. of America here, a man who can qualify as something of an expert on the subject. Mr. Bess has been a pioneer in installing refrigerated locker plants in the New York area, he has been perhaps the country's No. 1 rebuilder of low temperature cabinets for home storage of frozen foods, and he is now engaged in installing the first "Frozen Food Center" retail store in New York City which will be equipped to specialize in frozen food merchandising.

"There will be a big demand for home freezers, yes," he comments, "but in my opinion 60% of the requirements for storage of frozen foods in the home after the war will be met by low temperature compartments in standard household mechanical refrigerators."

"The other 40% will be handled by home freezers, locker storage plants, and possibly by such innovations as storage rooms or lockers in apartment house buildings."

"There may be more to the pos-



This is the artist's conception of the type of "Self-service Frozen Food Center" now being installed in New York City by John Bess, president of Refrigeration Corp. of America. It will operate on the "automat" principle, customers selecting food without seeing the packages first. The units will not be coin-operated, however.

sibilities of lockers or storage chests in apartment houses than a mere novelty effect. When apartment house owners and rental agencies are forced to go into competition for tenants after the War, such an added feature as storage facilities for frozen food may be quite a sales point.

"And if some apartment houses do it, then others will eventually have to follow suit to stay competitive."

But to return to his theory about super-markets holding the key to the distribution of frozen foods: Mr. Bess believes that after the war the big self-serve marketing centers will continue the terrific strides that they were making in the years just prior to the war.

"These markets had an appeal for all classes of people—upper, middle, and lower."

"Their big point of promoting 'impulse buying' of more things than the shopper had set out to buy, for the reason that all the items are readily available for them to see and select, make such stores attractive to progressive food retailers."

"And food packers like to deal with super-markets because they handle and turn over large volumes

of commodities."

Before the war, few super-markets did much of a volume on frozen foods. Mr. Bess gives two main reasons why this was so:

(1) Packers of frozen foods for the most part weren't ready to merchandise their products aggressively to or through retail food stores.

(2) Equipment was unsuitable to permit the self-service and impulse buying factors in super-market merchandising.

As for Point No. 1, Mr. Bess says that the present continuing failure of the majority of frozen food packers to push their product for retail store distribution is simply due to the fact that they have all they can do to meet demands for war agencies, but that having stepped up their volume in wartime, they will need to promote their products aggressively through retail stores when the wartime emergency demands no longer exist.

It is in the equipping of retail stores for merchandising of frozen foods that Refrigeration Corp. of America plans to specialize, says Mr. Bess. The ideas of the company in this particular field, now actually being put into effect in a "Frozen

(Concluded on Page 7, Column 1)

PHILCO

will have home freezer chests for every home!



THAT'S SOMETHING for the locker plant operator to keep in mind when selecting a line of home freezer units for post-war sale!

Make sure it's a line . . . a complete line . . . with units in sizes to suit every type of home in your community.

PHILCO will have such a line . . . small Home Freezer Chests for those with limited space or limited requirements; larger chests for those who want greater home storage capacity. Yes, a complete array of Home Freezer Chests designed to give you the right unit for every requirement!

PHILCO looks forward to the day when these Home Freezer Chests will be in the hands of wide-awake locker plant operators who realize the selling power of the Philco name and the Philco reputation for delivering "something extra" in quality and value. That day may come sooner than you expect!

When it does . . . will you be ready to get your share of the sales of Philco Home Freezer Chests?



PHILCO

Famous for Quality the World Over

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wishes its

Distributor Organization and the Refrigeration Industry Cordial

1944

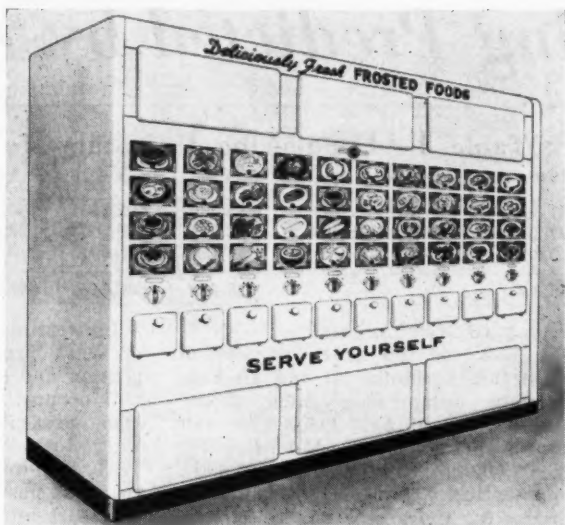
Holiday Greetings

KOCH REFRIGERATORS
Millard Mayer
President

Some Koch Refrigerator Equipment is now available on rated orders . . . We hope soon to have our complete line in production. NORTH KANSAS CITY, MO., U.S.A.

Vending Machine for Frozen Foods

Known as the "Frigid Freeze Zeromatic Self-service Frozen Food Cabinet," this automat cabinet is an outgrowth of John Bess' Frozen Food Center.



Frozen Food Automat System Is Planned

(Concluded from Page 6, Column 5) Foods Center" under construction now in New York City, are unique, Mr. Bess believes.

For in the type of equipment which Mr. Bess and his associates have designed, there will be no open display of frozen food packages, and no cabinets into which customers will dip to make a selection of their own.

Rather, there will be an arrangement somewhat similar to that of the Automat restaurants, with lithographed panels in color displaying the items that are directly behind each panel. The customer will use a selector lever to obtain the item of his choice, which will then slide out through a chute into a trough at the base of the panel, this trough being readily available to the customer, of course.

Behind the lithographed paneling is a low temperature storage room or section. Directly back of each individual panel is a tray or rack which holds a loading of 25 12-ounce or 16-ounce packages. When the selector lever is operated by the customer, a mechanical device releases the single package into a slide, whereby it is delivered to the trough.

When the rack is nearly empty, a signal will flash to warn the store attendants that it needs reloading.

According to present plans, larger packages would have to be handled by clerks, or by an attendant who might hand out the specified package through a panel, the customer possibly using a selector method similar to that used for the smaller packages.

No coin will be required for the release of a package, and should the shopper wish to return the package, she simply hands it to the checking clerk at the counter.

What advantages does Mr. Bess proclaim for this type of fixture for super-markets?

He thinks that it provides for easy selection and procurement of packages, and believes that the unusual display arrangement will promote "impulse" buying.

Another major claim is that the frozen foods will have proper temperature maintenance at all times, with little or no variation, since there will be no openings in the storage compartment except the trap door in the chute.

Two features which may or may not be included in future stores of this type, or in super-markets are a meat processing department and a locker storage section for customers.

The meat department will consist

of a large meat and poultry processing section which will be visible through glass partitions. The customer can thus watch skilled butchers prepare halves or quarters of animals which he may have purchased, or game which he may have shot.

The commodities prepared in this processing department will then be placed into one of the 50 frozen storage lockers, which will be made available to customers on a year-around rental basis. Each locker will have a capacity of 250 pounds of quick-frozen food, stored in suitable containers for future use.

Rental of the locker will give the renter possession of the key and access to the locker whenever the store

is open for business.

"We're not certain that the locker plant feature will be carried out," declares Mr. Bess. "The 'basement' locker storage plants in apartment houses might well eliminate lockers in stores.

"We believe that the locker service in the stores has a definite place, however, in that it inherently carries the appeal of a sort of exclusive club with special privileges to renters.

"With a membership list on hand, the store manager is obviously in a position to suggest advantageous buys.

"Locker operators in all parts of the country have been enjoying increasing success in the sale of 'specials' to locker renters."

Roland Brown Named OCR Durable Goods Chief

WASHINGTON, D. C.—Roland P. Brown has been designated as director of the Durable Goods and Products Division of the War Production Board's Office of Civilian Requirements, William Y. Elliott, WPB Vice Chairman for Civilian Requirements, has announced. Mr. Brown previously was deputy director of the Durable Goods and Products Division. He has been employed by WPB since July, 1942.

Mr. Brown will replace Henry A. Dinegar, who resigned Nov. 17. Mr. Dinegar has accepted a position as Appliance Division manager of the American Steel Export Co., New York City. He had been associated with the Durable Goods and Products Division of OCR since its establishment in July, 1941.



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Advance inquiries invited from manufacturers and distributors.

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At Wadsworth, such production is customary, and meets the highest critical standards.

Here, a unique machine setup and workers who think precision are intimately associated under one roof. They contribute special operations to many pieces and carry others through in their entirety, in great quantities.

We welcome conversations with all companies who intend to be postwar factors in their fields and will be glad to discuss the matter of applying Wadsworth skills to your special needs.

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Wadsworth is heavily engaged in many-sided war work. But our steady production of Military Watch Cases and our constant designing of the precious metal cases for the future are preserving the art of fine watch case development.

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GENERAL REFRIGERATION DIVISION

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American
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FOR GREATER PRECISION IN CABINET COOLING...



A NEW CEILING UNIT—BY M&E SOON TO BE RELEASED

A decided engineering advance in both styling and application giving heretofore unattainable efficiency in meat and provision storage ★ Holds precise cabinet temperature and maintains high relative humidity, by a modulated air flow that reaches every corner of the cabinet. Reduces dehydration and weight loss without producing sliming. Completely automatic including defrosting. ★ Will be available for all above-zero cabinets and storage uses.

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Manufacturers—Sales Organizations.

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PLANT: LANCASTER, PA.

Sales of Million Units for Commercial, Air Conditioning Predicted by Airtemp

Cameron Sees Big Gains After War

HOT SPRINGS, Va.—More than a million compressors, valued at \$182,526,000, will be sold for commercial refrigeration and air conditioning applications in the fifth year after the war, predicted Ralph C. Cameron, director of merchandising for Airtemp Division, Chrysler Corp., in a talk before the recent meeting of the Air Conditioning & Refrigerating Machinery Association here.

Mr. Cameron's talk was based on results of a survey made by Airtemp to determine postwar market possibilities in refrigeration and air conditioning. (In an earlier talk before the Indoor Climate Institute forum in Detroit, reported in the Oct. 9 issue of AIR CONDITIONING & REFRIGERATION NEWS, Mr. Cameron had presented Airtemp's estimates of the postwar residential air conditioning market.)

The fifth year total, 1,067,840, represents nearly three times as many units (349,049) as were sold during 1940, the "base" year selected by Airtemp. In the first full year of production after the war ends (allowing six months for reconversion of the industry) the industry should sell 529,443 units at \$85,813,000, a unit gain of 35% over 1940, ac-

1940	Size	V-1	V-2	V-3	V-4	V-5
361,000	1/4 to 1 hp.	468,339	602,240	700,000	810,000	920,000
27,367	1 1/2 to 10 hp.	53,918	75,502	93,600	114,000	136,500
5,682	15 to 100 hp.	7,486	8,604	9,400	10,340	11,340
349,049		529,443	686,346	803,000	934,340	1,067,840

cording to Mr. Cameron.

In V-2 (second postwar year of production) commercial and air conditioning compressor sales should total 686,346 at \$113,114,000, a unit gain of 29% over V-1. V-3 sales will hit 803,000 units (worth \$134,294,000), representing a gain of 17% over V-2. Sales for V-4 are estimated by Airtemp as 934,340 units (at \$157,907,000), a unit gain over V-3 of 16%; while the fifth year total of 1,067,840 represents a gain of 14% over the preceding year.

Bulk of the compressor sales estimated by Airtemp are naturally in the 1/4 to 1-hp. rating. As shown in Table 1, the V-5 estimates for example, show 920,000 sales of these small size compressors; 136,500 sales of compressors 1 1/2 to 10 hp.; and 11,340 sales in the 15 to 100-hp. class.

The general trend of refrigeration sales, based on a census of manufacturers, indicates that domestic applications account for 66% of annual unit sales, but only 39% of installed horsepower capacity, declared Mr. Cameron.

Industrial applications, while accounting for only 3.1% of annual unit sales, take 33.8% of the total horsepower, which is to be expected since the largest machines generally are installed in industry.

Commercial applications cover 25.1% of unit sales, and 11.2% of installed horsepower capacity; air conditioning installations account for 5.8% of unit sales, but 16% of installed horsepower capacity.

Interesting statistical breakdowns of what proportions various refrigeration and air conditioning products will occupy in the total picture were also presented by Mr. Cameron. These included estimates by the WPB Task Committees (see Table 2) for the first postwar year of production, and Airtemp's own estimates.

The Airtemp figures do not agree with those of the Task Committees in every instance, pointed out Mr. Cameron. For example, the Task Committees estimate that 500,000 home freezers will be sold in the first postwar year, while Airtemp sets a figure of only 50,000 home freezers.

Another example: the Task Committees see sales totaling 998,525 condensing units in the first postwar year, but Airtemp expects only 529,443.

Considerable gain in sales of room cooler units and packaged air conditioners is naturally predicted in the Airtemp report. According to Mr. Cameron, room cooler sales in V-1 should hit 55,000, compared with 30,000 in 1941 (see Table 3). By V-5 these units should be selling at the rate of 100,000 annually. Task Committee figures, however, set 100,000 units as the V-1 figure.

Packaged air conditioning units, ranging from 1 1/2 hp. up to 25 hp. should have a volume in V-1 of 24,500, compared with 6,043 sold in 1941 (see Table 4). Residential units of 3 hp. are expected to be the leaders with V-1 sales estimated at 10,000 units as the V-1 figure.

Table 2—WPB Task Committee Estimates for
First Postwar Year

End Use	1/4 to 1 Hp.		1 1/2 to 10 Hp.		Total
	Package	Remote	Package	Remote	
Home Freezers	500,000	.....	.....	.....	500,000
Room Coolers	100,000	.....	.....	.....	100,000
Water Coolers	80,000	.....	.....	.....	80,000
Bottle Beverage Coolers	60,000	.....	.....	.....	60,000
Ice Cream Cabinets	51,200	5,800	.....	.....	57,000
Display Cases	4,000	38,175	.....	.....	42,175
Bulk Beverage Dispensers	22,000	18,000	.....	2,000	42,000
Farm Freezers	30,000	.....	.....	.....	30,000
Reach-in Cabinets	22,000	2,550	.....	.....	24,550
Package Air Conditioning	.....	.....	23,814	.....	.....
2 Ton and Up .....	.....	.....	686	.....	24,500
Commercial F.F. Cabinets	17,000	.....	.....	.....	17,000
Soda Fountains	6,500	6,000	.....	.....	12,500
Walk-in Coolers .....	.....	5,840	.....	1,460	7,300
Frozen Food Lockers .....	.....	.....	.....	1,500	1,500
Total	892,700	76,365	24,500	4,960	998,525

Table 3—An Estimate of Room Unit Sales

1941	Hp.	V-1	V-2	V-3	V-4	V-5
12,000	1/4	.....	.....	.....	.....	.....
10,000	1/2	14,000	16,500	20,000	25,000	30,000
8,000	3/4	41,000	49,500	55,000	65,000	70,000
.....	1	.....	.....	.....	.....	.....
30,000	Total	55,000	66,000	75,000	90,000	100,000

Table 4—An Estimate of Package Air Conditioning Units

1941	Hp.	V-1	V-2	V-3	V-4	V-5
816	1 1/2 or 2	1,540	1,848	2,043	2,240	2,460
300	3 Residential	13,500	27,000	40,000	55,000	70,000
1,593	5	3,520	4,224	4,640	5,110	5,630
2,512	7 1/2	4,400	5,280	5,800	6,400	7,030
226	10	440	528	580	640	710
246	15	418	502	555	620	675
173	20	356	422	464	510	560
84	25	165	198	218	240	265
93	165	198	218	240	265
6,043	Total	24,500	40,200	54,500	70,990	87,590

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Trouble-Free performance behind
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Table 5—An Estimate of Self-Contained Commercial Units

	% Compressors					V-1	V-2	V-3	V-4	V-5
	1/4	1/2	3/4	1	1 1/2					
Water Coolers	70	30	...	...	...	37,200	44,700	50,000	55,000	60,000
Beverage Coolers	80	20	...	...	...	67,100	80,500	85,000	94,000	102,000
Complete Milk Coolers	50	30	20	...	...	2,200	2,640	2,800	3,200	3,500
Reach-in Cabinets	50	50	...	...	...	9,350	11,400	12,200	12,800	14,500
Frozen Food	80	20	...	...	...	50,000	100,000	150,000	200,000	250,000
Total	...	...	...	...	...	165,850	239,240	300,000	365,000	430,000

Table 6—The Trend to Package Units

	V-1	V-2	V-3	V-4	V-5
19.0	...	...	...	...	...
34.049	529,443	686,346	803,000	934,340	1,067,840
130.250	220,850	305,240	375,000	455,000	530,000
6.043	24,500	40,200	54,500	70,990	87,590
130.293	245,350*	345,440*	429,500*	525,990*	617,590

*Includes only water coolers, beverage coolers, milk coolers, reach-in cabinets, frozen food cabinets, room coolers, and "packaged" air conditioning and commercial refrigeration units.

Trend to Packaged Units Predicted

(Concluded from Page 8, Column 5)

13,500 units, said Mr. Cameron. In V-5 Airtemp estimates that 87,590 units will be sold, with 3-hp. residential units accounting for 70,000 sales.

Chief postwar trend in the commercial refrigeration field will be that towards packaged units, Mr. Cameron said (see Tables 5 and 6). There will, of course, be new markets for this type of equipment which will further boost sales in this category, he added.

Previously the market for commercial refrigeration equipment resulted from replacements, improvements, and the addition of new lines by established concerns. But in the future new packaged ideas, such as the vending machine, will find new markets, such as meat markets, soda fountains, roadside stands, and deluxe trailers, believes Mr. Cameron.

The whole commercial refrigeration market is divided by Mr. Cam-

eron into seven different groups: (1) food sales, (2) food service, (3) institutional, (4) rural, (5) industrial, (6) transportation, and (7) miscellaneous.

The food sales group includes groceries, delicatessens, dairy stores, meat markets, frozen food shops, food wholesalers, drug stores, and bakeries, and requires such equipment as display cases, condensing units, vending machines, water coolers, reach-in and walk-in refrigerators, vegetable cases, dough retarders, milk and bottle coolers, bars, candy cases, and cold storage warehouses, said Mr. Cameron.

The food service group, employing substantially the same equipment as the food sales group, comprises restaurants, cafes, cafeterias, cocktail bars, taverns, and hotels.

Listed in the institutional group are hospitals, sanitariums, clinics, schools, clubs, fraternities, and local, state, and federal institutions. They require such refrigerated equipment as serum refrigerators, reach-in and walk-in coolers, water coolers, frosted food cases, and, of course, condensing units.

Within the rural group are farms, cooperatives, slaughter houses, and locker plants, and their needs in-

clude locker storage items, equipment for chill and aging rooms, refrigerated warehouses, milk coolers, and reach-in and walk-in refrigerators.

The industrial group covers food processors, manufacturers, drug and chemical producers, dairy companies, carbonated beverages, bottlers, and brewers, and requires varied equipment such as coolant refrigeration machines, metal and rivet coolers, low temperature storage equipment, serum refrigerators, special chemical and drug processing equipment, ice cream cabinets, cold storage rooms, etc.

In the transportation group (trucks, railroads, airlines, ships) refrigeration equipment such as the following is required: ships' cargo refrigerators, ships' refrigerated stores, airline refrigerators, truck and trailer refrigeration, and railroad diner and freight car refrigeration.

Listed in the miscellaneous group are billiard parlors, bowling alleys, theaters, florists, morgues, laboratories, furriers, and fur storages. Refrigeration equipment in this group is likewise varied, covering such items as mortuary boxes, reach-ins, beverage coolers, laboratory testing apparatus, etc.

In discussing the future of commercial refrigeration sales, Mr. Cameron stressed several factors affecting postwar prospects for the industry. He listed these: (1) replacement, normally 50%, (2) rural electrification, (3) acceptance of frozen foods, (4) new industrial applications, (5) greatly reduced manufacturing and field inventories, (6) refrigerated transportation, (7) reopening and expansion of commercial establishments, and (8) "government effect" on capital investment.




In the 'Post-War Plans' of Many Farm Families

The BEN-HUR Farm Locker Plant

Talk to any farmer about a farm locker plant and his first comment will be, "wish we had it now." And he'll follow with the promise that food freezing and frozen storage is the FIRST thing he's going to add after the war.

For most farmers already know the benefits of owning a BEN-HUR FARM LOCKER PLANT... the economy, time, and food saving advantages of freezing and storing farm-grown vegetables, meat, poultry for delicious meal variety weeks and months later.

This is evidence of your future market for new BEN-HUR FARM LOCKER PLANTS—a volume market ready just as soon as they can be produced.

Let us put your name on the list to receive complete data and sales information on BEN-HUR FARM LOCKER PLANTS, when this data can be released.

BEN-HUR MANUFACTURING CO.
634 E. Keefe Ave. Milwaukee 12, Wis.

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SPORLAN SELECTIVE CHARGES G-K-U-Z-O-L-C

THE ARMY AIR FORCE

FLYING FORTRESS B-17, B-25, MITCHELL, AT-6 TEXAN, P-47 THUNDERBOLT, P-51 MUSTANG, P-38 LIGHTNING, L-4 PIPER

both give **PEAK PERFORMANCE**
for like each type of army ship, each Sporlan charge has a specific job to do!

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For consultation on any refrigeration or air conditioning valve problem, contact

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from comfort cooling to low temperature refrigeration, with the wide range of applications in between, no one charge can perform perfectly under all conditions.

Sporlan has developed selective charges G-K-U-Z-O-L-C which are designed to give the best operating characteristics for each class of installation.

Only by using SPORLAN valves can you be assured of PEAK Performance on EVERY installation.

Sporlan manufactures Solenoid Valves... Solenoid Pilot Controls... Modulating Pilot Controls... Refrigerant Distributors and the only Thermostatic Expansion Valves with Selective Charges.

Table 7—An Estimate of Air Conditioning and Commercial Compressor Unit Sales—1/6 to 1 Hp.

Hp.	V-1	V-2	V-3	V-4	V-5
1/6	7,910	9,492	10,500	11,500	12,300
1/4	196,032	266,355	332,500	379,500	441,000
1/2	116,145	148,478	169,100	193,850	217,950
3/4	68,890	82,368	92,900	105,150	118,250
1	67,730	81,578	90,000	103,500	112,300
1 1/2	11,632	13,959	15,000	16,500	18,200
Total 1/6 to 1 Hp.	468,337	602,240	700,000	810,000	920,000

Table 8—An Estimate of Air Conditioning and Commercial Compressor Unit Sales—1 1/2 to 10 Hp.

Hp.	V-1	V-2	V-3	V-4	V-5
1 1/2	8,656	10,388	11,515	12,720	14,700
2	7,452	8,942	9,915	10,920	12,700
3	22,137	37,364	41,500	67,700	83,975
5	8,313	9,976	11,000	12,000	14,250
7 1/2	4,142	4,970	5,480	6,040	6,700
10	3,218	3,862	4,255	4,620	5,175
Total 1 1/2 to 10 Hp.	53,918	75,502	93,600	114,000	136,500

Table 9—An Estimate of Air Conditioning and Commercial Compressor Unit Sales—15 to 100 Hp.

Hp.	V-1	V-2	V-3	V-4	V-5
15	2,046	2,450	2,614	2,885	3,160
20	945	1,134	1,243	1,365	1,500
25	945	1,134	1,243	1,365	1,500
30	780	936	1,050	1,150	1,265
40	910	1,092	1,200	1,300	1,425
50	715	856	950	1,050	1,150
60	390	468	510	560	615
75	250	300	330	365	400
100	195	234	260	290	325
Total 15 to 100 Hp.	7,186	8,604	9,400	10,340	11,340



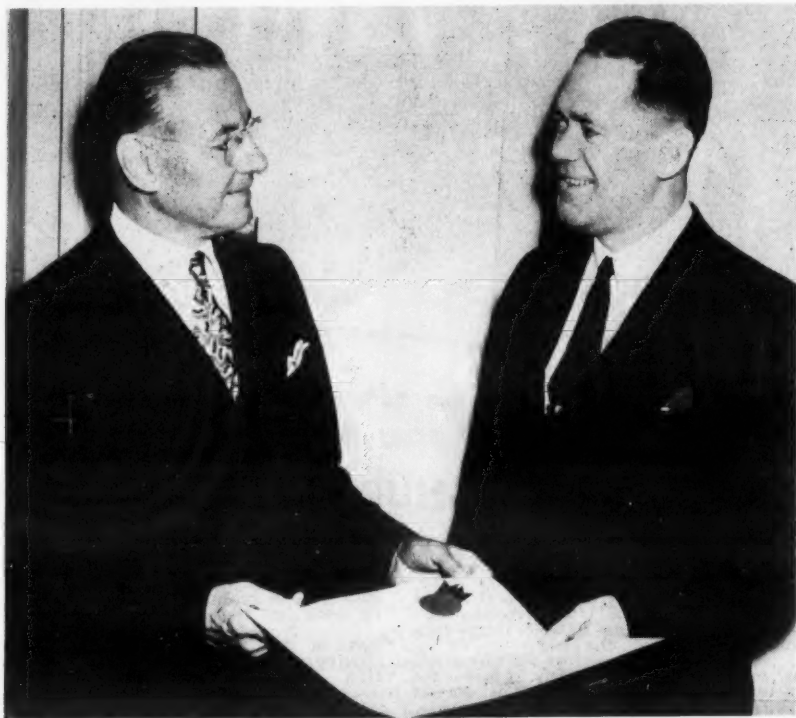
AMANA "Walk In" COOLERS

AVAILABLE NOW TO BUYERS WITH PRIORITY... in any size or type. Amana's long experience in building "Walk-In" Coolers is assurance of efficiency and long service. Insulation of latest models is of corkboard or "Fiberglas" insuring extra economy and top cooling ability.

REFRIGERATION DIVISION
AMANA SOCIETY
AMANA, IOWA

Awarded the Army-Navy "E" with White Star for continuance of excellence in production of war materials.

A 'First' for Indoor Climate Institute



Paul B. Zimmerman, president, Indoor Climate Institute, presents Walter E. Voisinet, president of the Western New York Chapter, I.C.I., with the Number One charter granted to a local chapter.

Arnold's Is New G-E Outlet

HAMILTON, Ohio—Arnold's Appliance Store, 138 High St. here, was opened Dec. 1 to retail postwar a complete line of General Electric home appliances.

Arnold Krebs, proprietor, has included in his new store the better known makes of furniture and lamps.

Approximately 2,000 people attended the opening, and as a goodwill gesture on the part of Mr. Krebs, three new General Electric automatic irons were given away. Arnold's will feature the all-electric kitchens when they are available. Also established is a completely equipped service department.

Wookey of New England Starts Firm in Calif.

ARCADIA, Calif.—W. P. Wookey, who operated an appliance and repair business in the East for 15 years, has purchased property here for the erection of a building to house his Frigidaire sales and service agency. He is a veteran of World War I, having been commissioned under General Eisenhower.

Former Frigidaire Men With Higgins



J. O. Crary, center, head of the new appliance division of Higgins Industries, Inc., discusses distribution plans with W. H. Bramblett, left, manager of the domestic department, and L. V. Busenlener, right, in charge of the commercial and air conditioning department.

Higgins, Landing Craft Builder, Forms New Orleans Appliance Distributorship

NEW ORLEANS—Higgins Industries, Inc., builder of wartime landing craft and for several years a distributor of air conditioning equipment and marine accessories, has established an appliance division to distribute household and commercial appliances in this territory.

Three former Frigidaire men—J. O. Crary, W. H. Bramblett, and L. V. Busenlener—will run the division, which will have headquarters and display rooms at 521 Park Ave. here in an air conditioned building.

Mr. Crary, division manager, had spent 15 years in the appliance field with Frigidaire and other manufacturers, before joining Higgins as assistant to the vice president and general manager, Andrew J. Higgins, Jr. He later became administrative manager. He had been for several years manager of the commercial and air conditioning department in Frigidaire's New Orleans branch.

Mr. Bramblett, who will manage the domestic department, served Frigidaire from 1926 to 1942 in Atlanta, Dallas, Dayton, and New Orleans. He was regional accountant

at Dallas, office manager and comptroller in New Orleans, and appliance sales manager in charge of Louisiana and Mississippi territory. His present position is manager of Higgins' material procurement department.

Mr. Busenlener, former Frigidaire sales engineer and more recently head of Higgins' commercial and air conditioning department, will manage the commercial and air conditioning in the new appliance division.

Wide range of household appliances, commercial refrigeration, and air conditioning lines are planned by the firm. Commercial lines will include Carrier home and farm freezers, Carrier room coolers and all types of air conditioning equipment, commercial refrigeration units, and ventilating and heating equipment.

Included in the domestic lines are Motorola radios and television sets, Blackstone laundry equipment, Eureka vacuum cleaners and home cleaners, Electromaster electric ranges and water heaters, garbage disposal units, cordless electric irons, small appliances, and kitchen cabinets. Complete locker storage systems will also be handled.

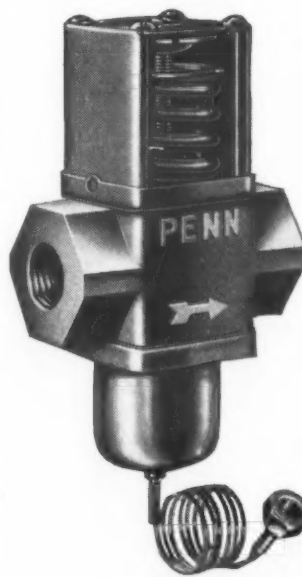
A
Merry
Christmas
to You

*We of Temprite Products
wish you, our friends and customers,
all good wishes for
Christmas and the New Year.*

TEMPRITE PRODUCTS CORPORATION

FORTY-SEVEN PIQUETTE...DETROIT 2, MICHIGAN

How Long Will a Water Valve Last?



PENN SERIES 246 WATER REGULATORS are available in two styles—flanged and threaded—in a wide range of sizes.

The answer: Just as long as its sliding parts move freely! Submerge these vital parts in water—as in ordinary valves—and their days are numbered, for water causes sedimentation, corrosion and rust. That's why PENN designed the new Series 246 Water Regulator so that no sliding part ever contacts the water. No fear of a sticking valve seat here—or a rusty range spring.

Water hammer has been eliminated, too, without sacrificing the extreme sensitivity to changes in refrigerant head pressure. Manual flushing is still another of the many features in this new PENN water valve. You'll find these new-type valves fully described and illustrated in your free copy of Bulletin R-1986. Send for it today! Penn Electric Switch Co., Goshen, Ind. Export Division: 13 East 40th Street, New York 16, U.S.A. In Canada: Powerline Devices, Ltd., Toronto, Ont.

PENN
AUTOMATIC CONTROLS
FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

Caudell Takes Sales Post With Philco



W. M. CAUDELL, JR.

BLOOMINGTON, Ill.—The Home Freezer Division of Portable Elevator Mfg. Co. here, has announced the appointment of W. M. Caudell, Jr. as assistant sales manager.

He was formerly district representative and later manager of the Standard Products Division of the Corbin Screw Corp., New Britain, Conn.

Tent Stakes For Army Tested In 'Mechanically Frozen' Soil To Select Proper Types for Coldest Climates

FORT BELVOIR, Md.—Low temperature refrigeration equipment is being utilized by U. S. Army Engineers here in the testing of various types of tent stakes used by American fighting forces in cold countries throughout the world.

The creation of "synthetic weather" to produce frozen ground used in these tests is one of the most unusual applications of low temperature refrigeration equipment to come out of World War II, the engineers report.

Refrigeration equipment utilized in actually freezing small sections of top soil consists of a low temperature chamber having an open bottom. The sides and top of this box are heavily insulated. Frick refrigeration compressors are employed to produce temperatures down to -70° F. within the chamber.

When the insulated cold chamber is placed over soil of any given type,

the soil is frozen solid within a few hours and may be reduced to temperatures well below 0° F. After the ground is frozen to the desired point below the surface, and to the required temperature, tent stakes of various kinds are driven into the frozen earth to determine how they will stand up under actual field conditions encountered in very cold climates.

Metal tent stakes, as well as stakes made of hickory and other tough, straight grained woods are being tested by U. S. Army Engineers. Obviously, if the stake shatters, splits, or bends when being driven into frozen terrain, it cannot be used successfully by military forces making camp in Alaska, Iceland, or other places having a severe winter climate.

While results of the tests are not made public, they enable Army engineers to evaluate the usefulness of

various types of stakes.

By using low temperature refrigeration equipment to freeze sections of ground for these tests, U. S. Army engineers are able to determine what type of tent stake will stand up and give satisfactory service when used under the most adverse winter climate conditions. On the basis of these tests, recommendations are then made to Army authorities charged with the purchase of this important equipment.

Ontario Locker Assn. Will Meet Jan. 22-23

TORONTO, Ont.—Annual meeting of the Ontario Frosted Food Locker Association will be held Jan. 22 and 23 at the King Edward hotel here, announces H. S. Parish, secretary-treasurer of the association.

Processing, wrapping, and merchandising of frozen foods, as well as slaughtering, curing, and smoking of meats, and the locker operator's place in the home freezer field are slated for discussion. The program includes entertainment features and a banquet.

Drayer & Hanson Will Occupy New Building In Los Angeles

LOS ANGELES—Drayer & Hanson, Inc., manufacturer of heat exchange equipment here, has leased the entire building formerly occupied by the Los Angeles Lighting & Fixture Co. at 767 E. Pico Blvd.

The new quarters will house the purchasing, sales, and advertising departments in addition to facilities for fabricating certain commercial and special types of products.

Philco Dividends Higher This Year

PHILADELPHIA — Philco Corp. has declared a year-end dividend of 40 cents per share of common stock. This dividend brings total payments this year to \$1.20 per share, as compared with \$1 per share in 1943.

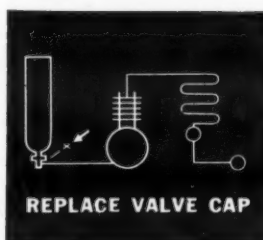
MAINTENANCE TIPS

for users of "FREON-12"

No. 5

HANDLING CYLINDERS

The following suggestions are offered to assist users of "Freon-12" to obtain maximum efficiency from systems in which this refrigerant is used:



REPLACE VALVE CAP

Close valve immediately after the cylinder is emptied to avoid drawing liquid "Freon-12," air, or oil into the cylinder.

Cylinder valve can be protected by tightly securing hoods after cylinders are empty and ready for return.



STORE CYLINDERS UPRIGHT



DO NOT FORCE CONNECTIONS

leaks, and valves cannot be repaired.

1. To prevent dirt from entering the valve after charging, replace the brass cap on the outlet connection as soon as the valve is closed and the cylinder has been disconnected. This will also forestall damage to the threads of the valve.

2. Cylinders of "Freon-12" should be stored upright. Keep them in a cool, dry place away from salt or other corrosive elements. Rust damages cylinders. It will cause hood to stick and may injure the valve.

3. The connections on "Freon-12" cylinders should fit easily and snugly. It is unwise to force them. Threads on the system should be the same as those on the cylinder valve outlet. Stripped threads cause

When the cylinder is connected to the system, the valve should be opened slowly. Only those tools or wrenches approved by the compressed gas manufacturers should be used. Hammering valve stems in opening or closing valves may cause damage to the valve or system connection and lead to unnecessary repairs and the loss of "Freon-12."



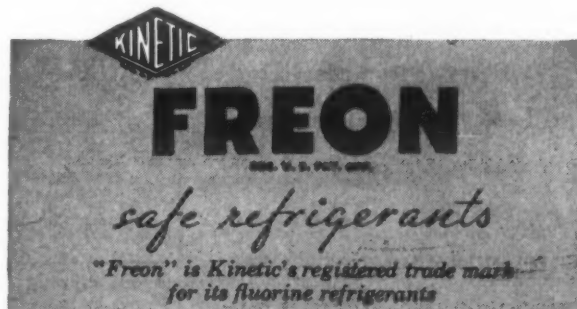
SAFETY DEVICE BUILT-IN VALVES

4. "Freon-12" is supplied in cylinders with valves containing built-in safety devices. To insure proper function of these safeguards, users are cautioned against tampering with the valves and fuse plugs.

5. Cylinders should be protected against cuts or abrasion. Cylinders should never be used for rollers or supports, since they are not designed for these purposes.

6. It is recommended that Kinetic Chemicals, Inc., be consulted if any doubt exists regarding the proper handling of "Freon-12" cylinders.

Care in handling and using cylinders of "Freon-12" will repay the owner by helping to prolong their life and maintain high operating efficiency of the refrigeration system. Send for reprints of this and other Maintenance Tips devoted to methods of charging, emptying cylinders, detection of leaks, shutting down systems and other data of value to users of "Freon-12." Write Kinetic Chemicals, Inc., Tenth & Market Streets, Wilmington, Del.



● Please continue to return empty cylinders promptly ●

BUY A WAR BOND EVERY MONTH

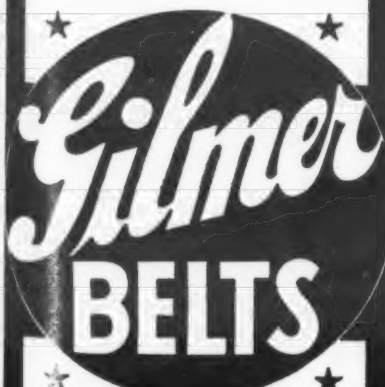
NEW 1944 CATALOG



Write for copy on your letterhead
Washing Machine Parts Catalog will not be issued in 1944

SERVICE PARTS CO.
3511 Lake St. Melrose Park, Ill.

Important war production can be halted through so simple an accident as the failure of a belt on air conditioning and refrigeration equipment. Little things can do a lot of harm.



That's why you'll find it wise to feature Gilmer Belts, and be set for replacement business and service jobs of this type. Rugged, long-lived, efficient Gilmers are good-will builders that bring you a profit. Order through your jobber... he's ready with Gilmers.

L. H. GILMER CO.
Facony, Phila. 35, Pa.

Bankers Eye Postwar Appliance Financing

90% of Banks Planning Loans to Consumers After Look at Estimated Appliance Sales

NEW YORK CITY—Banks are planning to take a major part in the postwar financing of household appliance buying.

Before the war about 70% of the nation's banks included consumer loans in their service activities. A recent survey by the American Bankers Association, of which every bank in the country is a member, shows that 90% of them plan to do so after the war.

Looking ahead, both banks and finance companies can see a busy future. For two out of every five household appliances purchased before the war were bought on the installment plan, the majority of these being the big ones—refrigerators, ranges, radios, ironers, vacuum cleaners.

And forecasts of postwar markets for these are impressive. The average of conservative estimates predicts a minimum of 3.8 million domestic refrigerators sold annually during the first several years, a figure representing \$650 million worth of business. The previous all-time peak was 1941's 3.5 million units, at \$542.5 million.

Washing machine sales are predicted, on a similar average of conservative estimates, at 2.3 million annually, or \$200 million, compared

with 1941's 1,892,435 units at \$148,556,150 retail.

Radios look like \$600 million, as opposed to \$415 million in 1941.

Air conditioning sales will hit \$300 million, against 1941's \$50 million. More than \$60 million of these will be small one-room units.

Farm equipment, home modernization, and equipment for commercial establishments will represent substantial investments calling for consumer loans. The American Bankers Association already has published a Bank Manual on Automobile Financing, with another printing on the way because of the excessive demand. Pamphlets on household equipment and airplane financing are being prepared.

Banks once considered instalment financing unsound. But the safety and profit figures recorded by the consumer credit business, plus the prospect of additional employment of their own growing deposits, at a good return, have changed bank thinking.

The changed trend of thinking became evident during the early 1930's. The census of 1940 showed a rise from practically no banks participating in 1933 to a total of 10,381 banks by the end of 1939, representing about 70% of the commercial banks then active.

Banks at that time held \$4 of retail instalment paper for every \$10 held by sales finance companies. Before this time banks had taken part only through large loans to the finance companies. This tie-in is still maintained.

Even without active bank participation, instalment buying has become an integral part of mass-production economy during the past two decades. In normal times half of all the new autos sold, three fifths of the used ones, and two fifths of all household appliances are bought "on time."

Before the war the consumer credit activity of many banks was restricted largely to direct loans to individual customers. Now they are surveying the possibilities of tying up with dealers and financing them.

This kind of postwar competition may lower the cost figures in consumer goods financing. The finance companies themselves are getting ready for the postwar hustle. The big ones are studying ways to operate more efficiently.

Their preparation has included such moves as hiring engineers to determine how bookkeeping and other mechanical controls can be handled by fewer people. They are planning new branches in smaller communities, enlarged staffs, re-establishing old relationships, and making new contacts.

The major trouble on the horizon promises to be Regulation W, the government's wartime restriction on instalment buying. It was set up late in 1941 to limit consumer purchasing power at a time when manpower and materials were needed to make the machinery of war.

Regulation W increased down payments on instalment purchases, and

'Tie-Ins' For Kelvinator Radio Show



Discussing promotional plans for Nash-Kelvinator's new coast-to-coast radio show, C. T. Lawson, vice president in charge of Kelvinator sales (left), and Charles J. Coward, director of advertising and sales promotion of the Kelvinator division, look over one of the new window posters. The show will be aired every Sunday afternoon at 4:30 p.m. over the entire Blue network.

shortened the term over which instalments could be completed. It has since been tightened even more in several places.

Today the average down payment is about one-third of the purchase price, as compared with prewar's approximate 10%, while the instalment payments must be completed within a year, as compared with prewar's two years or more.

Consumer credit groups have been

moving to ease the regulation, effective after the German collapse, with complete discontinuation after peace in the Pacific. But so far without effect. The Federal Reserve System, which administers the regulation, is quoted as saying that it will never be relaxed to the point of prewar inconsistency.

Some voices in the consumer credit field have backed this stand, saying that moderate regulation can do away with many of the competitive practices that before the war led to over-extended credit terms—a dollar down, a dollar a year for the rest of your life—a dollar now, the rest when you catch me, and the like.

The instalment business won't hit its stride for a couple of years, the experts believe. It will take time for consumer goods manufacturers to reach top production, and initial purchases even so will be made from surplus war earnings.

More than a thousand finance companies were in the instalment business at the time of the 1940 census. Two-thirds of the total volume they handled was done by three giant companies: Commercial Investment Trust, Commercial Credit, and General Motors Acceptance Corp.

The banks will need capable personnel. Instalment financing is a complicated business, requiring skilled men. Banking associations warn their members so. But the banks are getting ready just the same.

A name to remember...



for refrigeration valves, fittings and Accessories

The Weatherhead Company was privileged to serve the refrigeration industry before the war, is serving it to a restricted degree today, and looks forward with anticipation to a general resumption of our trade relationships after the war. If you are engaged in postwar planning now, we invite you to avail yourself of our laboratory, research and engineering departments. You will find us most cooperative.

Look Ahead with 
Weatherhead
THE WEATHERHEAD COMPANY
CLEVELAND, OHIO

Manufacturers of vital parts for the automotive, aviation, refrigeration and other key industries.
Plants: Cleveland, Columbia City, Ind., Los Angeles
Canada—St. Thomas, Ontario

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The Newest and Finest
ELECTRIC Water Coolers

ALL SIZES FOR NAVY and LAND USE

EXCLUSIVE DEALER FRANCHISE

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L. E. RABJOHN
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Cools Air-Warm Bottles
in 10 minutes to 45°
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Lead Crystal handblown
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U. S. PATENTS 2,075,831; 2,163,968

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Mr. Dealer:

Wherever you sold a refrigerator
you can sell a Fahrenheitor.

Women love it's beauty,
Men its utility.

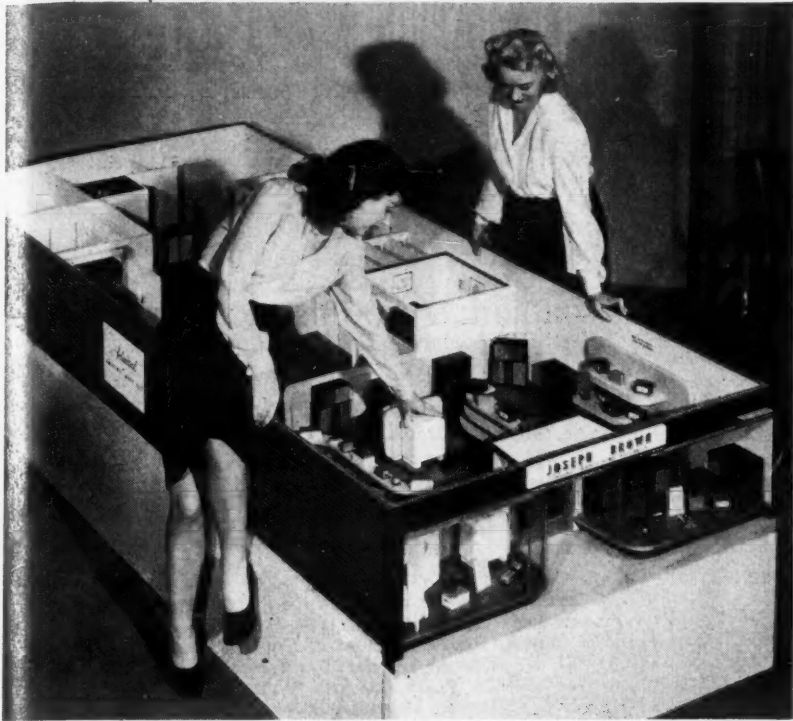


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Not For Dolls-- But For Dealers



To Norma Long, putting a miniature home freezer in place, it's just a novel doll house. But for electrical appliance dealers who are viewing it this month in a series of dealer meetings being held by Admiral Corp., it's a carefully built replica of how a model dealer's store may well look postwar. It was designed by George W. Walker, Detroit industrial designer, at the behest of Ross D. Siragusa, Admiral's president. The scale model, 4 by 10 feet, is a replica of a store, actual dimensions of which would be 35 by 90 feet.

Dealers Get Some Details on Admiral's Postwar Products

CHICAGO—Distributors of Admiral Corp. are relating to the dealers in the field details of the refrigerator and home freezer lines which Admiral will offer to the postwar market—details which were revealed at the Admiral distributors convention last month.

The following are some of the things the dealers are learning about Admiral's plans:

The "Dual-Temp" line of household refrigerators will come in four models: 7 and 9-cu. ft. standard, and 7 and 9-cu. ft. deluxe models. A fully hermetic refrigerating system will be used in these models.

Capacity of the low-temperature compartment in the "Dual Temp" models (which Admiral officials claim can be used to freeze foods as well as to store foods already frozen) is being increased from 50 pounds to 80 pounds of frozen foods or ice cubes. Temperature in this compartment is being lowered from 10° F. to below 0° F.

The following claims of special features will be made for the "Dual Temp" models: (1) because cooling coils are built into the walls of the cabinet, there need be no defrosting of the regular storage compartment. Freezer compartment will have to be defrosted three or four times a year; (2) a "moist cold" regular temperature compartment; (3) "Sterilamp" which utilizes ultra-violet rays to kill germs and retard mold; (4) the improved low-temperature compartment, which is now to be located at the top of the box.

In addition to the "Dual-Temp" line, there will be a line of "conventional" refrigerators in four models: 7 and 9-cu. ft. standard, and 7 and 9-cu. ft. deluxe.

L. H. D. Baker, vice president in charge of appliances, who presented the information about the refrigerator line, also gave the following details about the Admiral home freezer:

It will be equipped with controls which will permit a setting of -20° F. for actual freezing processing work, and which also permit return to normal setting after which the whole cabinet will operate at regular low-temperature storage settings.

An automatic alarm will give notice of failure of the refrigeration system, even though the failure may be caused by a faulty fuse or complete current stoppage.

With a holdover capacity of 48 hours built into the freezer, the householder will have ample time to arrange for repairs and to provide protection for the contents.

The initial model will be one with 6-cu. ft. capacity, but other sizes will probably be built as the demand for them is indicated.

Ross D. Siragusa, president of Admiral Corp., said that Stewart-Warner's sales on its refrigeration products (rights to which have been purchased by Admiral) were just under \$7 million annually.

"We expect to boost this to \$12½ million because of demand, promotion, sales effort, and re-styling," said Mr. Siragusa.

"We expect annual sales of about \$2 million on the electric range line. We expect to achieve a sales volume of \$15 or \$16 million in radio products."

It was announced that a finance plan had been negotiated with Universal C.I.T. Credit Corp. to assist not only in financing floor stocks, but also with consumer paper.

E. S. Brinsley of Universal C.I.T. Credit Corp., explained the company's "Limited Recourse Plan" available to all dealers showing a minimum net quick worth of approximately \$1,000, and whose record is clear and reputation good.

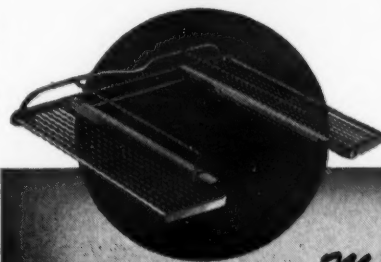
Prime feature of this plan is that the dealer is only partially liable to Universal C.I.T. as to his retail contracts. The finance company's agreement with him will provide that if the purchaser pays the first three monthly instalments promptly, the dealer is no longer liable for the full balance owing on the contract, and if a repossession should thereafter occur, the dealer would only pay Universal C.I.T. 50% of the amount of the remaining balance owing on the contract. If the purchaser should default before at least three instalments have been paid, the dealer is fully liable.

Admiral distributors will encourage their dealers to rely heavily on the "Flex-O-Plan" book of plans and ideas for the radio and appliance store of the postwar era, in making plans for store arrangements. The ideas for the store designs were created by George Walker, Detroit industrial designer who assisted in the designing and styling of postwar Admiral products.

Admiral is now spending more than \$750,000 annually in advertising, declared Seymour Mintz, advertising and publicity director.

Currently Admiral is advertising in five national magazines—*Colliers*, *Liberty*, *McCalls*, *Parents*, and *House Beautiful*—plus farm periodicals.

FOR STAINLESS STEEL
REFRIGERATOR SHELVES
WHY NOT TALK OVER
YOUR PROBLEMS WITH
THE LEADING
MANUFACTURER OF
STAINLESS STEEL
SHELVES?



WALL WIRE
PRODUCTS
COMPANY

11333 GENERAL DRIVE
PLYMOUTH, MICHIGAN

Makers of STAINLESS STEEL AND
REFRIGERATOR SHELVES AND WELDED WIRE PRODUCTS

MANHATTAN
FHP V-BELTS

MORE POWER
Grips the grooves...
stops slip—flexible
construction for uniform
"pull"

LONGER WEAR
Endless cord construction resists internal heat and side wear.

SILENT RUNNING
Smooth running and noiseless on high-speed drives.

THE MANHATTAN RUBBER MFG. DIVISION
of Raybestos-Manhattan, Inc.
Townsend Street Passaic, New Jersey

**NORMAL SUCTION
PROCESS
WATER COOLERS**

to 25 gallon capacities.

Compact in design...can be mounted on floors, walls or ceilings.

Suitable for drinking water bubbler service, cafeteria or restaurant glass filler service.

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DAY & NIGHT MFG. CO.**

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Charging
to Victory!



Illustration from Inland Poster showing operation in the production of the Inland-made carbine

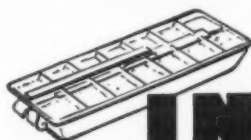
The remarkable effectiveness of the Inland-made Carbine—the light, maneuverable and deadly accurate little .30 caliber gun—has been proved in every theater of war.

Yet, when the war began it was only a design which normally would have been years away from finished production.

Inland's resourcefulness in carrying the Carbine from design to quantity manufacture in record breaking time has been widely recognized. In fact, the Carbine has been called one of the outstanding Ordnance developments of the war.

The Carbine is one of many Inland products for Victory, whose efficient high speed production has demonstrated the value to America in war, as in peace, of Inland's years of engineering enterprise and manufacturing versatility.

INLAND MANUFACTURING DIVISION, General Motors Corporation, DAYTON, OHIO



INLAND

Manufacturing

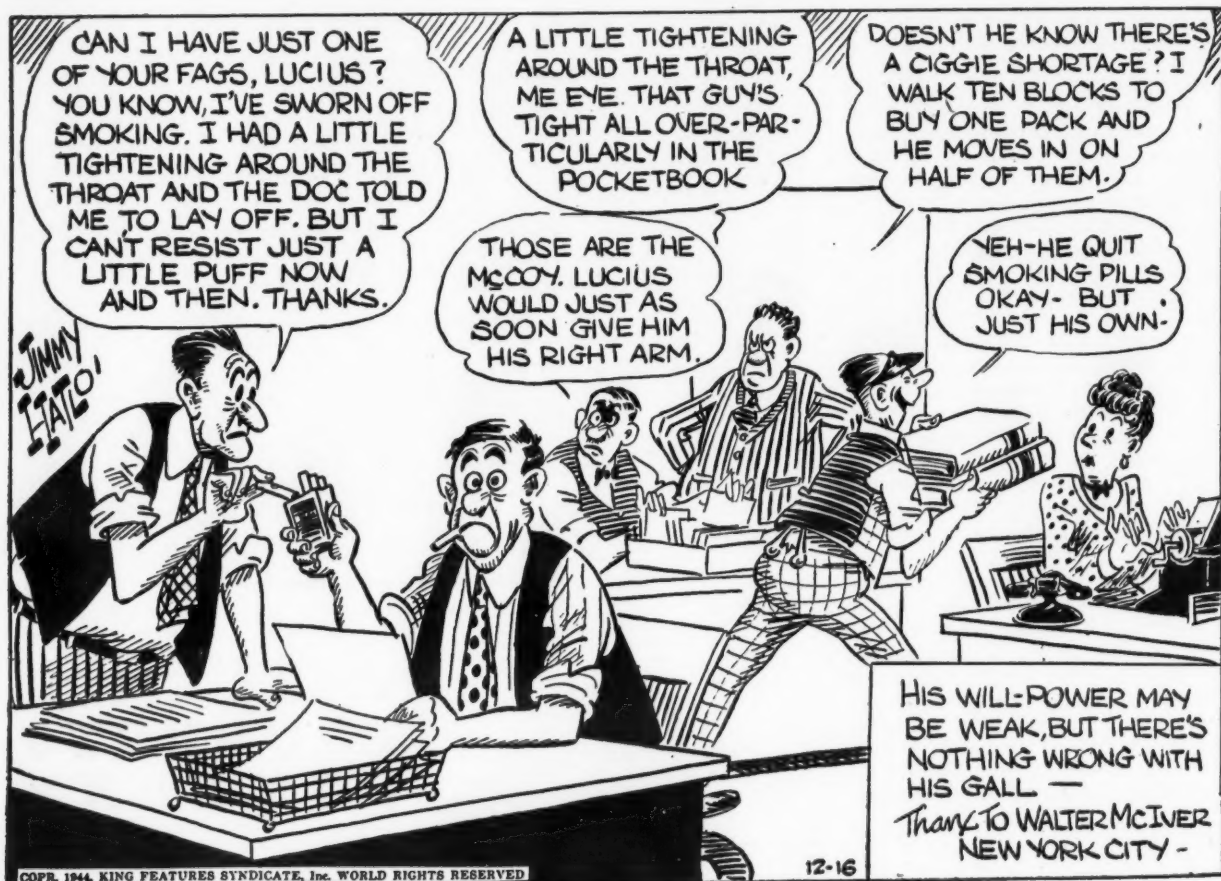
RUBBER, METAL, PLASTICS

Remember Pearl Harbor
Buy At Least
An Extra \$100 War Bond



Inland Products for Victory include Carbines, Tank Tracks, Gun Sights, Helmet Liners, Extinguisher Horns, and Rubber, Synthetic Rubber and Metal Parts for Tanks, Aircraft, Submarine Chasers, Torpedo Boats, Artillery Lighters and Landing Craft.

They'll Do It Every Time By Jimmy Hatlo



War Bonds Will Solve Your Christmas Shopping Problems

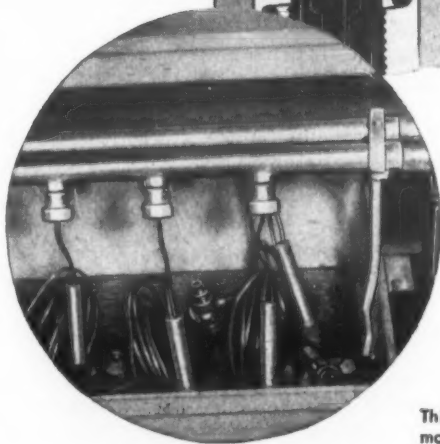
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Incredible, but true! Diaphragms like those you'll find in Alco Thermo and Evapotrol Valves withstand the equivalent of 300 years of uninterrupted service on Alco test lines.

Samples of each lot of thin stainless steel diaphragm material are installed on standard valve assemblies and mounted in a special test fixture, as shown. Under pressure, the diaphragms go through millions of flexing cycles. The slightest sign of failure is cause for rejection.

This 300-year diaphragm test is another reason for the dependable, trouble-free performance you get from Alco Valves. Remember, every part of an Alco Valve is Alco-tested. Alco Valve Co., 853 Kingsland Avenue, St. Louis 5, Missouri.



This test delivers a far more jolting stroke than diaphragm would get in actual service.



Designers and Manufacturers of Thermostatic Expansion Valves; Pressure Regulating Valves; Solenoid Valves; Float Valves.

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Trade Mark registered U. S. Patent Office; Est. 1926

Air Conditioning & REFRIGERATION NEWS

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VOLUME 43, No. 16, SERIAL No. 822, DECEMBER 18, 1944

So You Want a Dealership?

CURRENTLY here at the NEWS we are keeping two girls busy answering correspondence from dealers who are looking for new franchises.

At least 97% of these inquiries are for names of manufacturers who will produce household refrigerators, plus those who will market home and farm freezers.

Maybe it will save us all a lot of time if we print those two lists right here, in this prominent place, in the largest machine-set type we use. Please clip and save—thus easing the burden on our postman, on our typewriters, and on our supply of stationery.

MANUFACTURERS OF HOUSEHOLD REFRIGERATORS

Copeland Refrigeration Corp., Sidney, Ohio. Crosley Corp., Cincinnati, Ohio. Edison General Electric Appliance Co., Inc., Chicago, Ill. Evers Hardware Co., Denton, Tex. Frigidaire Div., General Motors Sales Corp., Dayton, Ohio. General Electric Co., Specialty Appliance Sales Div., Bridgeport, Conn. Gibson Electric Refrigerator Corp., Greenville, Mich. Gilfillan Bros., Inc., Los Angeles, Calif. Kelvinator Div., Nash-Kelvinator Corp., Detroit. Leonard Div., Nash-Kelvinator Corp., Detroit. Norge Div., Borg-Warner Corp., Detroit. O'Keefe & Merritt Co., Los Angeles, Calif. Philco Corp., Philadelphia. Westinghouse Electric & Mfg. Co., Mansfield, Ohio. Servel, Inc., Servel Electrolux Sales Div., Evansville, Ind. (gas and kerosene refrigerators). Perfection Stove Co., Inc., Refrigeration Div., Cleveland, Ohio (gas refrigerators). Admiral Corp., 3800 Cortland Ave., Chicago. Clayton & Lambert Mfg. Co., 11111 French Rd., Detroit. Coolerator Co., Duluth 1, Minn. International Harvester Co., Chicago.

MANUFACTURERS OF HOME AND FARM FREEZERS

Deepfreeze Div., Motor Products Corp., N. Chicago, Ill. Esco Cabinet Co., West Chester, Pa. Sanitary Refrigerator Corp., Fond du Lac, Wis. Wilson Cabinet Co., Smyrna, Del. Frigidaire Div., General Motors Corp., Dayton, Ohio. Victor Products Corp., Hagerstown, Md. International Harvester Co., Chicago. Schaefer, Inc., Minneapolis 1, Minn. Emil Steinhurst & Sons, Inc., Utica, N. Y. Harder Refrigerator Corp., Cobleskill, N. Y. Portable Elevator Mfg. Co., Bloomington, Ill. Ben-Hur Mfg. Co., Milwaukee 12. Sherer-Gillett, Inc., Marshall, Mich. Admiral Corp., Chicago. Seeger Refrigerator Co., St. Paul, Minn. Savage Arms Corp., Utica 1, N. Y. Coolerator Co., Duluth, Minn. Westinghouse Electric & Mfg. Co., E. Springfield, Mass. Jordon Refrigerator Co., 235 N. Broad St., Philadelphia 7. Fogel Refrigerator Co., Philadelphia 37. Norge Div., Borg-Warner Corp., Detroit 26. Edison General Electric Appliance Co., Chicago 44. General Electric Co., Bridgeport, Conn. Kelvinator Div., Nash-Kelvinator Corp., Detroit 32. Ed Friedrich, Inc., San Antonio, Tex. Radiant Fuel Co., 1211 Oakwood Ave., Toledo, Ohio. Weber Showcase & Fixture Co., Los Angeles 54. Philco Corp., Philadelphia 34. Amana Society, Amana, Iowa. American Refrigerator & Machine, Inc., 615 Third St., N. Minneapolis, Minn. Jewett Refrigerator Co., Inc., Buffalo, N. Y.

That's all there is—there isn't any more. At least, as of this date. We don't care what rumors you've heard about so-and-so coming into the business. So-and-so may, but we doubt it. The lists above comprise all those who have committed themselves. Nobody else is in a position to award a franchise.

Good luck, and happy hunting!

Wesco Executive



JOHN T. URBAN
Recently appointed general appliance manager, Westinghouse Electric Supply Co.

Cold Storage Experts Getting Fresh Foods To Forces In Europe

PARIS, France—American soldiers fighting in Europe are being supplied with sizeable quantities of fresh meat and chicken at frequent intervals, all "according to plan," reports the office of the Quartermaster General.

Throughout liberated France, Quartermaster soldiers are operating cold storage and refrigeration plants in which perishable foods are stored for delivery by refrigerated vans to the troops in the field.

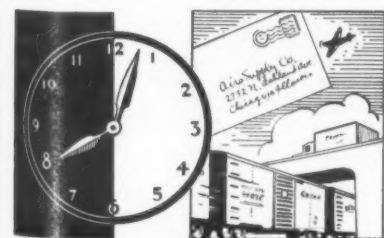
Nearly all are privately owned plants, taken over and operated by the Germans during the Nazi occupation, and now used by the Americans. Some of them had to have bomb and shell damages repaired before the Quartermasters could use them. French owners are reimbursed for their use.

The "plan" began with the organization and specialized training of Quartermaster Refrigeration Companies back in the United States. These units learned in the military and civilian schools not only how to operate refrigeration and cold storage plants but also how to construct and maintain them.

New and speedier methods, some of them improvised, have been inaugurated in some of the plants. In some plants, for instance, the slow, cumbersome rope-elevators used by the German operators have been replaced by chutes. Over them scoot the securely packaged meats, fowl, butter, and other items from the storage rooms to a lower floor or into waiting refrigerated trailers on which they travel to the fighting front.

Rogers Gets Sales Post

CHICAGO—John E. Rogers, for the past 12 years sales manager in 24 midwestern states for Galvin Mfg. Corp., has been appointed director of radio sales for General Television & Radio Corp. here, announces Herman R. Rose, president.



AROUND THE CLOCK SERVICE While you sleep—while you are out on profitable service calls—while you take care of other important business matters—tools, equipment, and parts ordered from AIRO speed on their way to you. No valuable time wasted waiting for counter service when you buy by mail from AIRO, the middle west jobber geared up to give nationwide service "around the clock."

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Stoner Chief Engineer For Ben-Hur Mfg. Co.

MILWAUKEE, Wis.—C. W. Stoner, formerly with the testing and merchandise development laboratory of Sears, Roebuck & Co., has been appointed chief refrigeration engineer for the Ben-Hur Mfg. Co., manufacturer of home and farm freezers.

Mr. Stoner was graduated from Purdue University in 1930 with a B.S.M.E. degree, and spent six years with the Union Ice & Cold Storage Co. of California in the refrigeration engineering department. He then joined Sears-Roebuck.

A member of the A.S.R.E. and N.A.R.R.E., Mr. Stoner has been active in the development of the low temperature cabinets.

Rhimer Heads Sales For Trilling & Montague

PHILADELPHIA—G. Albert Rhimer, who has been engaged in the merchandising of household appliances for the last 18 years, has been appointed sales manager of Trilling & Montague, Philadelphia distributor of Norge and Farnsworth products, it is announced by David M. Trilling, partner in the firm.

Mr. Rhimer, who was with this company for six years prior to the war, has spent the last three years doing engineering sales work with the nation's largest shipyards and, according to Mr. Trilling, will take up active management of the firm's sales organization as soon as he can terminate his war activities.

For a Product That Goes Over Tokyo

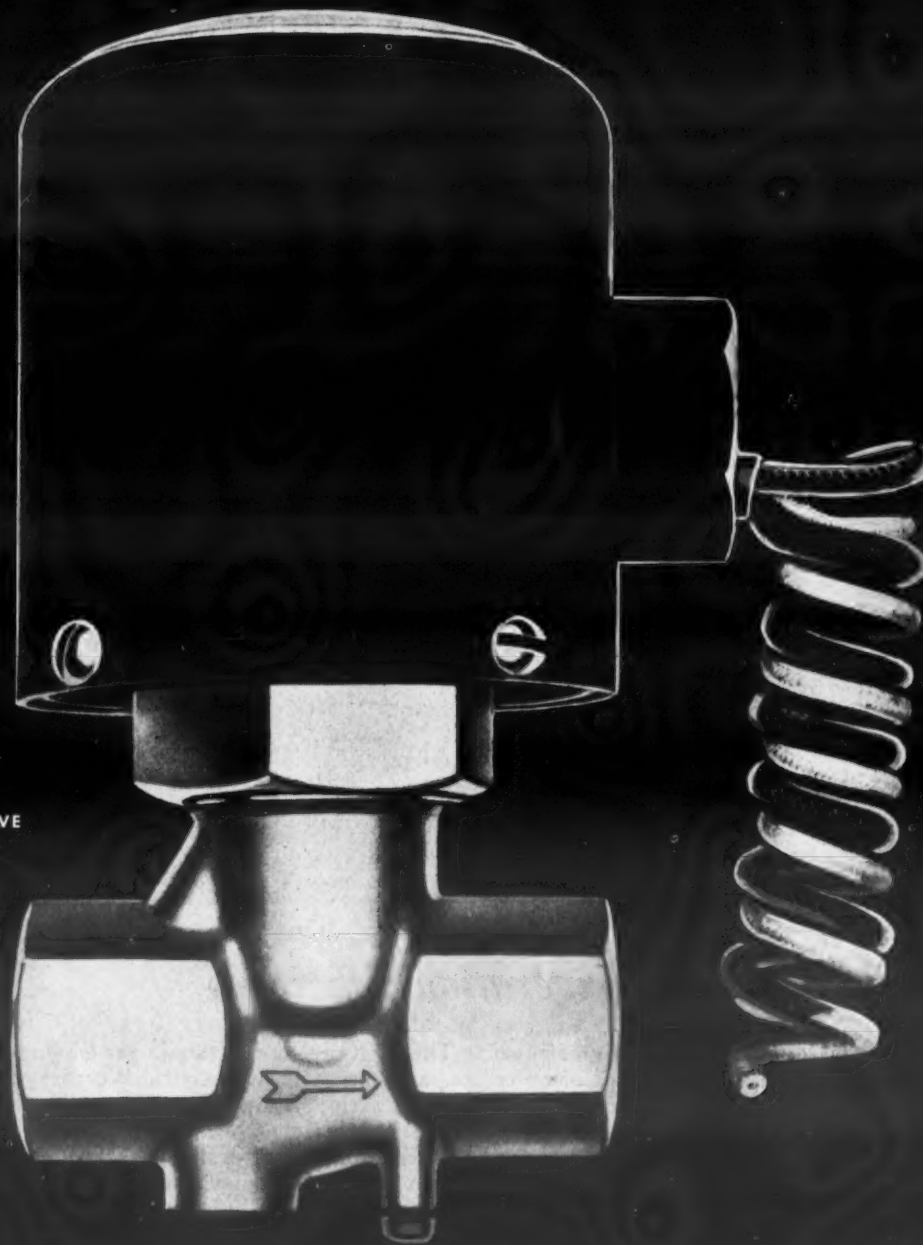


Walter G. Seeger, president of the Seeger Refrigerator Co., is presented with the Army-Navy "E" flag by Lt. Col. Bailey A. Wright of the Army Air Forces, for the company's work in the manufacture of a bomb rack for the B-29 "Superfortress" and other war contracts.



Dependability doesn't happen...

IT'S BUILT INTO EVERY A-P VALVE



A-P MODEL 73-RJ
SOLENOID REFRIGERANT VALVE



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AVAILABLE ON A-P SOLENOID
REFRIGERANT VALVES**

Add a new advantage to A-P DEPENDABLE Solenoid Refrigerant Valves! It's Dual-Voltage coils—permitting



use of the solenoid on either 115 or 230 volts. No need to stock valves for each voltage. Simplifies inventory and service, too. Available now on A-P Solenoid-Models 71-J, 73-RJ and 270. Ask your jobber for them TODAY.

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Stocked and Sold by Progressive Refrigeration Jobbers Everywhere —
Recommended and Installed by Leading Refrigeration Service Engineers.

*A good way
to start the
New Year*

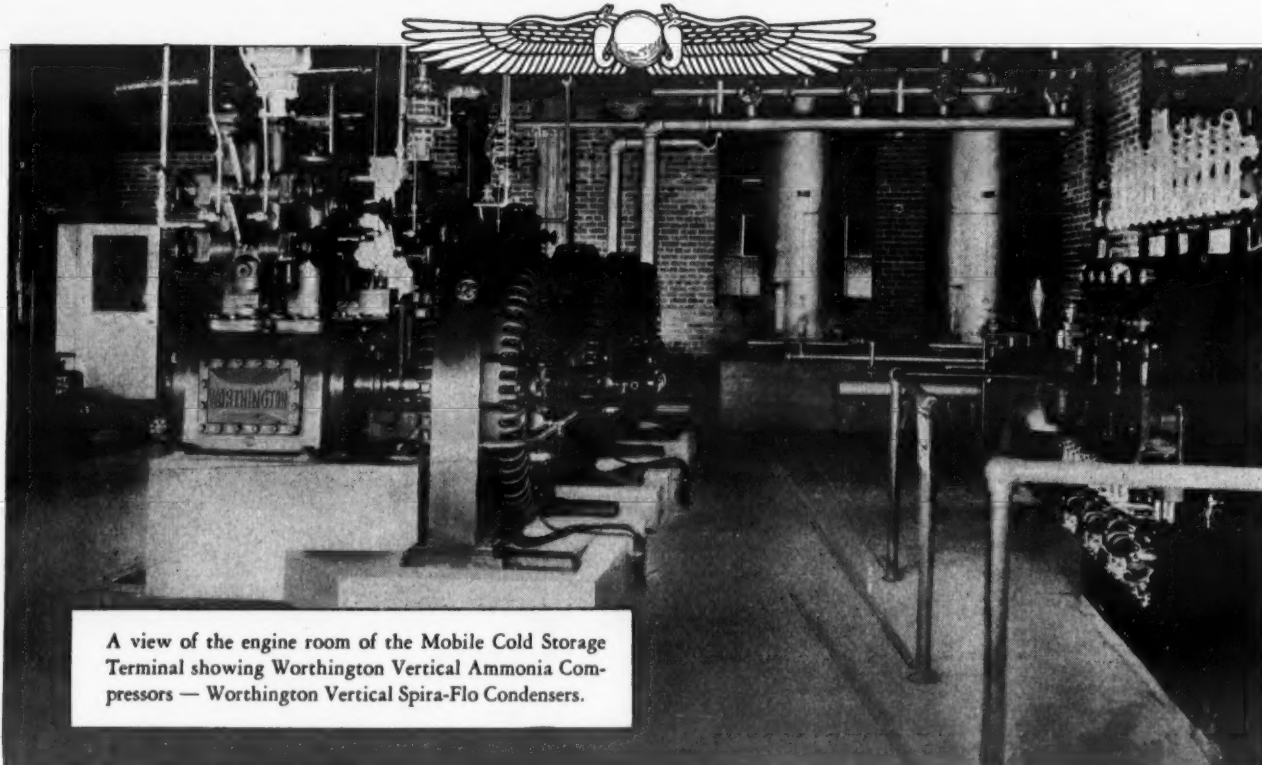
1945

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OASIS
Electric
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Coolers*

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**WE'LL TAKE THE HIGH LOADS...
AND WE'LL TAKE THE LOW LOADS**



A view of the engine room of the Mobile Cold Storage Terminal showing Worthington Vertical Ammonia Compressors — Worthington Vertical Spira-Flo Condensers.

...and give Maximum Refrigeration Efficiency

The modern refrigerating system of the Mobile Cold Storage Terminal, operated by the Alabama State Docks Commission, is providing just the kind of service that its customers want. Many kinds of food products are stored in the new five-story plant — in temperatures described as — "20 below zero... or any temperature you require."

The three Worthington 9 in. x 9 in. Vertical Duplex Ammonia Compressors, shown above, can be operated in seven possible ways — each singly or in various combinations — a modern arrangement which enables the company to run at high efficiency during high loads and low loads.

The suction and discharge of all these compressors are Worthington Feather Valves*, well known for their

high efficiency. The high pressure ammonia gas leaving the compressors passes into the two vertical Worthington Spira-Flo Condensers, equipped with patented Spira-Flo water distributors controlling the water fed to each vertical tube. Condensing water is taken from the river by means of a 4-inch horizontal split case Worthington Centrifugal Pump direct-connected to a 7½ h.p. motor.

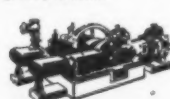
This Mobile Cold Storage Terminal, like so many other highly efficient refrigerating systems, relies on Worthington for its vital parts. In fact, Worthington can supply more vital parts for air conditioning and refrigerating systems than any other manufacturer. For copy of bulletin, write *Worthington Pump and Machinery Corporation, Harrison, N. J.*

WORTHINGTON BEHIND THE NAME



*Reg. U. S. Pat. Off.

1. Horizontal compressors for ammonia, propylene, butane



2. Angle engine compressors



3. Centrifugal compressors



4. Absorption refrigerating machines



5. Shell and tube refrigerating equipment



**FIVE MORE
REASONS WHY
WORTHINGTON
LEADS IN
INDUSTRIAL
REFRIGERATION**

Will the 'Heat Pump' Prove Practical For Installation In Average Home?

ST. LOUIS—That "heat pumps" have definite possibilities in the residential heating field, though much development work remains to be done, was pointed out to members of the American Institute of Electrical Engineers at a meeting here by R. U. Berry of General Electric Co., Bloomfield, N. J. Opening his discussion, Mr. Berry explained the purpose of the heat pump as follows:

When the reason for using the refrigerator is to take advantage of the lowered temperature inside the cabinet, it is called a refrigerator. When the primary object is to heat the surrounding room, it is called a reversed cycle refrigerator or a heat pump. The type of equipment used in either case is the same.

In the case of the heat pump heating a home, instead of placing the evaporator inside of an insulated cabinet it is more effective to place it in the outdoor air or in a supply of water that can be cooled, and the condenser is usually in the form of a finned coil with a fan blowing the heated air from the coil through ducts to the house. In any case the heating of the house air and the simultaneous cooling of the outdoor air or water supply are fundamental to the heat pump, even though the outdoor air being cooled may be at a temperature well below zero.

Fig. 1 shows a simplified schematic diagram of a direct expansion heat pump. When operating in the winter

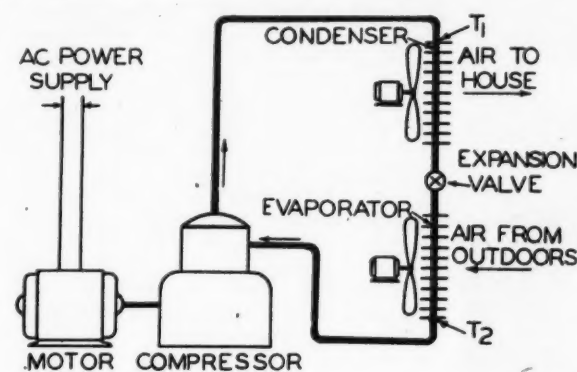


Fig. 1—This schematic diagram shows the chief elements of a heat pump achieved by reversing the cycle of a refrigeration system.

time for heating, air from the house is forced through the condenser where it is heated sufficiently to satisfy the heat loss of the house. Air from outdoors is forced through the evaporator where it is cooled sufficiently to provide its contribution of heat to be transmitted to the house. The liquid refrigerant inside the evaporator is boiled by the heat from the outdoor air at a boiling pressure and temperature sufficiently below the outdoor air temperature to effect the necessary heat transfer.

The compressor draws the refrigerant gas from the evaporator and discharges it to the condenser at a high enough pressure and temperature so that it will condense and transfer its heat to the outgoing house air stream. The expansion valve maintains the pressure difference between condenser and evaporator by regulating the flow of refrigerant through the system. To use this same system for cooling the house in summer the outdoor air and house air streams are interchanged with dampers or an equivalent result is accomplished by other means.

Neglecting all losses, the heat output from the condenser of this system is equal to the heat input to the evaporator plus the electrical input to the compressor motor. Since the outdoor air is free, the efficiency of the system is the heat output divided by the heat equivalent of the electrical input and because this is always greater than 100%, it is called a coefficient of performance. The electrical input multiplied by the coefficient of performance gives the heat output to the house.

The relative proportion of the heat obtained from electrical input and from outdoor air depends primarily on the indoor and outdoor temperatures. This is quite different from a fuel burning furnace whose efficiency is substantially independent of outdoor temperature.

Both follow a Carnot cycle in the theoretical ideal and the theoretical ideal efficiencies are similar in form, that for the heat pump being

Coefficient of Performance = $C \text{ of } P = \frac{T_1}{T_1 - T_2}$
where T_1 is the house or condenser temperature, both being the same in

the ideal, and T_2 is the outdoor or evaporator temperature. Temperatures in this case must be measured on the absolute scale.

Curve A in Fig. 2 shows the coefficient of performance for a perfect Carnot engine heat pump maintaining 70° F. in a house at various outdoor temperatures. It will be noted that with a heat pump at 20° F. outdoor temperature it is theoretically possible to obtain 10.6 times as much heat in the house as would be possible by using the same power input in electric resistance heaters. In addition to a perfect heat engine this would require condenser and evaporator heat transfer surfaces sufficiently large to transfer the heat without appreciable temperature differences and correspondingly large airflows in the house and outdoor air circuits.

Sizing the heat transfer surfaces and airflows to values that would be considered practical in a summer air conditioning system of similar proportions, would give curve B in Fig. 2.

(Continued on Page 17, Column 1)

Pump Efficiency

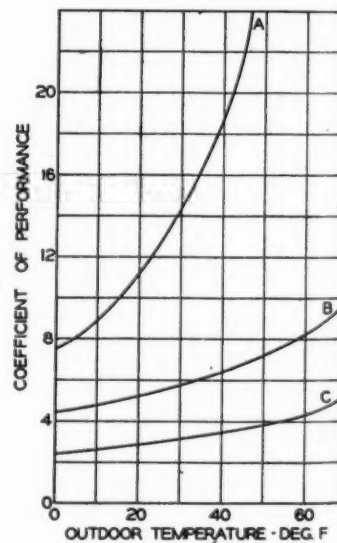


Fig. 2—Efficiency characteristics of a heat pump maintaining a house at 70° F. (See text for explanation.)

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REFRIGERATION APPLIANCES, INC.

923 W. LAKE ST.
CHICAGO 7, ILL.

Problems Involved in 'Heat Pump' Use

(Continued from Page 16, Column 5)

2 where the refrigerant condensing temperature has been increased and evaporating temperature decreased a total of 60° F. This would permit delivery of heated air to the house at 105° F. to 110° F. which is considerably lower than would be used with a fuel burning warm air heating plant but not enough lower than usual discharge temperatures from a normal year around residential air conditioning system to have a prohibitive effect on the cost of fans and duct work.

Curve C in Fig. 2 shows coefficients of performance that can be obtained with refrigeration equipment available today. This curve differs from curve B in that proper allowance has been made for the use of "Freon-12" instead of a perfect refrigerant, for mechanical and other inefficiencies of equipment, and for power required by auxiliaries such as fans. The performance indicated by this curve is believed to have been reached by installations now in operation using outdoor air as a source of evaporator heat. It will be noted that in climates such as Pittsburgh or Philadelphia, where less than 3% of the requirements of the heating season occur at below 20° F. outdoor temperature, an average coefficient of performance for the whole heating season of better than 3 to 1 can be reasonably expected.

At about 52° F. outdoor temperature the realizable coefficient of performance reaches 4 to 1. The best steam power generating plants today have an overall thermal efficiency of approximately 34%. Hence, even allowing 15% for transmission losses between the generating station and the home, the heat pump will deliver at the 52° F. outdoor condition 116% of the heat that was in the fuel burned at the generating station for supplying energy to the heat pump. Under favorable conditions the heat pump can pick up from its outdoor air more than all of the losses from the system including the heat rejected to its cooling water by the generating station.

Output of Heat Pump

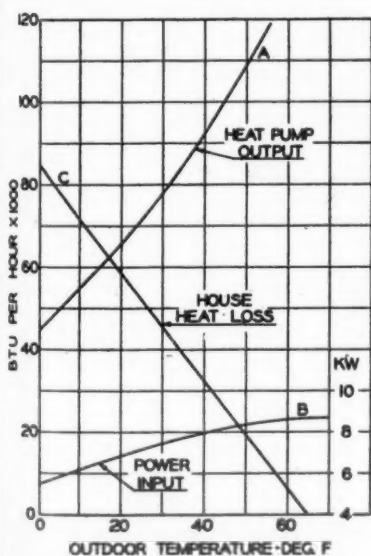


Fig. 3—This graph shows output characteristics of a heat pump with a constant-speed 7 1/2 hp. compressor.

At first glance this might appear to offer encouragement to the seekers of perpetual motion machines but a second glance reveals that while we have increased the number of B.t.u. available at the heat pump condenser over what we started with in the fuel, its temperature level would not be attractive to the central station operator as a source of mechanical work. The heat pump effects a favorable exchange of high grade electrical energy for a greater quantity of low grade heat energy and it is well known that the same favorable rate of exchange cannot be obtained in the opposite direction. However, the heat output of the heat pump is quite suitable for heating homes and even at a 3 to 1 season average coefficient of performance and 15% electrical transmission losses it gives 87% overall fuel economy.

Of course, fuel utilization efficiency is not so interesting to the operator of a heat pump as the annual operating cost in dollars. Here there can be a considerable variation of opinion because there are no reliable statistics available on the actual average operating efficiencies of the various kinds of fuel-burning domestic heating plants.

If we assume hand fired coal furnaces at 55% efficiency and oil and gas automatic furnaces at 75% efficiency, they would compare as follows with a heat pump averaging 3.0 coefficient of performance using power at 1 cent per kilowatt hour. The heat pump would have the same operating cost as coal at \$14 per ton, oil at 10 cents per gallon, manufactured gas at 40 cents per thousand cubic feet or natural gas at 80 cents per thousand cubic feet. This is approximately the picture as it exists today with a heat pump constructed with general purpose refrigeration equipment in a climate such as Pittsburgh and drawing its evaporator heat from the outdoor air.

It can be substantially improved by circulating more house air at a lower temperature and using larger heat transfer surfaces, thus increasing the first cost and departing from present limits of practice in year around air conditioning systems. It can also be improved by further development of the equipment or by finding a higher temperature source of heat for the evaporator than outdoor air.

Curve A in Fig. 3 shows the output characteristic, calculated from test data, of a heat pump using a constant speed 7 1/2-hp. condensing unit with an outdoor air evaporator. In spite of the fact that the coefficient of performance or efficiency falls off at low outdoor temperatures, the power input, as shown in curve B, also falls off because of the decrease in circulation of refrigerant at low suction densities as the evaporator temperature and pressure fall. Curve C shows the requirements of a house needing 85,000 B.t.u./hr. at 0° F. outdoor temperature which would be a three bedroom house of average proportions, well insulated, in a climate such as Pittsburgh or Philadelphia. This would be a house in the \$8,000 to \$10,000 price range at pre-war levels.

The 7 1/2-hp. heat pump has capacity to heat this house down to 15° F. outdoor temperature. Rather than use a larger heat pump system to take care of temperatures below 15° F. a storage scheme could be used. The excess capacity of the system at temperatures above 15° F. would be used to heat water in a storage tank to a temperature of 100° F. to 110° F. and when the out-

door temperature falls below 15° F. this reservoir of heat can be drawn upon to carry the house.

From curves A and C, Fig. 3, it is obvious that the constant speed compressor gives far too much capacity at the higher outdoor temperatures. This is not desirable in any warm air heating system where it is likely to cause short cycling and excessive temperature fluctuation in the house. This type of system therefore requires a multi-speed compressor motor or other means of capacity reduction with the necessary controls (Concluded on Page 18, Column 3)

Your refrigeration parts and supply house in Central New York and Northern Pennsylvania

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209 Jefferson Ave., Scranton, Pa.

Phone 5-4000
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Brazing

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Cross-section of a brazed joint magnified 10X

Fabrication of lightweight aluminum cores for many types of heat exchangers—aircraft radiators, oil coolers, heaters—is accomplished by brazing. Aluminum alloys contribute strength and light weight, superior heat conductivity and resistance to corrosion. The brazing process provides speed and uniformity of production.

In the tubular-core section pictured above, thin-walled aluminum tubing and Alcoa sheet, perforated to receive the tubes, are assembled in a fixture which holds all parts firmly in place. Furnace-brazing is then em-

ployed to join them into a rigid, pressure-tight unit. Other fabricators may employ flux-bath brazing, hand welding and brazing, or combinations of all methods.

How the molten brazing alloy flows at the line of contact, forming a fillet which bonds all parts securely together, is seen in the above photomicrograph.

Alcoa will assist you in adapting the brazing process to your products, advising on initial and final cleaning methods, fluxes and brazing temperatures. For this help, write ALUMINUM COMPANY OF AMERICA, 1975 Gulf Building, Pittsburgh 19, Pennsylvania.

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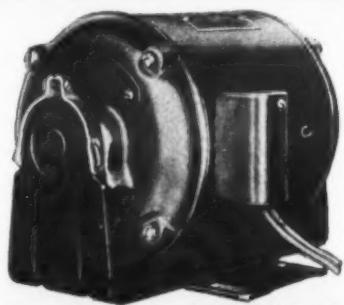
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Bulletins MU-182 and MU-183 fully describe the comprehensive line of Wagner motors. Service Instruction Manuals MU-7B and MU-30B too will be of help.





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'Heat Pump' Offers Many Possibilities

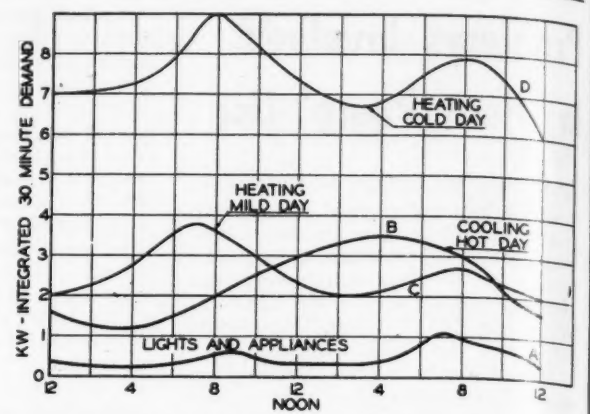
(Concluded from Page 17, Column 3)
to modulate the system output to the approximate requirements of the house.

A requirement of 85,000 B.t.u./hr. to heat a house at 0° F. is composed of conduction through walls and windows and infiltration of outside air. In summer the indoor-outdoor design difference is typically only 16° F. which reduces the B.t.u. load to 19,400 B.t.u./hr. To this must be added the requirements for increased fresh air supply, people, lights, solar radiation and latent cooling of the fresh air and people. All of these can vary widely but it can be said that the majority of insulated houses of this size can be satisfactorily air conditioned with a 3-hp. system giving from 35,000 B.t.u./hr. to 40,000 B.t.u./hr. under hot weather conditions. A few with large glass areas exposed to the sun may require 5-hp.

Any authoritative discussion of installed prices of heat pumps would be hopelessly beyond the scope of a short exposition such as this. It would involve the effects of local codes and building trades practices, methods of selling and installing, selection of installation materials, and all the other things that cause large variations in prices between one locality and another and between two installations in the same locality, when the system is assembled from individual pieces specifically engineered in the field to the requirements of a particular house.

Nonetheless some highly approxi-

Fig. 4—Kilowatt demand requirements of a heat pump at various conditions.



mate estimated figures might be of value as an indication of relative costs compared to conventional systems. A warm air oil fired furnace for an 85,000 B.t.u./hr. well insulated new house might be sold for \$700 today in a medium size city. This would include uninsulated ductwork, grilles, oil tank, and all necessary items for a complete installation with a minimum of accessories.

If this installation had been purchased as a year-around system, the duct sizes would have been somewhat larger, parts of the ductwork would have been insulated, and the added equipment might have included a 3-hp. condensing unit, an evaporator coil mounted in the supply ductwork, an evaporative condenser, refrigerant piping, cooling controls, refrigerant, and numerous smaller items. Using the same method of estimating as in the case of the simple furnace this system complete would be sold for \$1,650. Again using the same basis for estimating, a 7½-hp. heat pump with two step capacity modulation, outdoor air evaporator supplemented with a 1,000 gallon insulated water storage tank for peak load, and automatic controls except for manual changeover from heating to cooling would be sold for \$2,600. The heat pump might in some cases be entitled to a credit of approximately \$150 because it would not need a chimney. These figures are not represented as being either average or typical but are prices that might be encountered in a climate such as Pittsburgh using standard heating and refrigeration equipment available today.

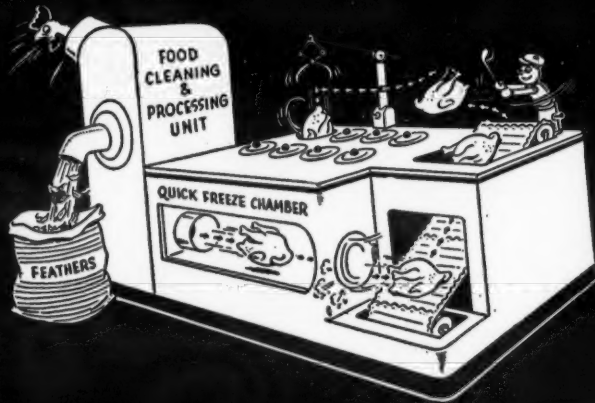
Fig. 4 shows the effect on electric demand of installation of various types of systems in the typical six room house in a Pittsburgh climate. Curve A is for reference and shows the average hourly demand of an all electric home containing all electric appliances except heating and air conditioning. It averages 360 kilowatt hours per month total usage and it will be readily recognized that few homes of this size actually approach or exceed this figure.

Curve B shows the demand of a 3-hp. summer air conditioning installation in the same house on a hot day when the outdoor temperature reaches 96° F. in the afternoon. Curves C and D show hourly demand curves on a mild day and on a 0° F. day, respectively, for a heat pump in this house. If this house were heated with electric resistance heaters the peak demand of the heating system would be 25 kw.

Estimating the average annual energy consumption of a heat pump is obviously a tedious undertaking because the coefficient of performance is a function of outdoor temperature and the result is doubly dependent on the weather. However, approximate calculations for the average Pittsburgh climate, including both winter heating and summer cooling give a total usage of 17,000 kwh. per year. If Pittsburgh represents an average climate in the United States, for which reason it was chosen here, then even after all homes have reached a lighting and appliance usage of 4,000 kwh. per year, it would require installation of heat pumps in only 25% of them to double the domestic electric load.

Quite apart from the residential possibilities of heat pumps, these systems should receive greatly increased attention in the postwar period for their commercial and industrial applications. Many industrial applications will be found where there will be an economically advantageous use for both the heating and cooling that these systems provide simultaneously. Many industrial and commercial applications will be found where summer air conditioning is necessary and where a high internal cooling load will make the cooling equipment adequate as a heat pump without increasing its size. Again, the availability of well water or process waste heat at a temperature too low for space heating but above outdoor temperature may make the heat pump, as an addition to a cooling system, far more attractive economically than in residences.

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To hold the low temperatures required, and to keep operating costs at a minimum, home freezers must be insulated with a material having very definite characteristics and properties.

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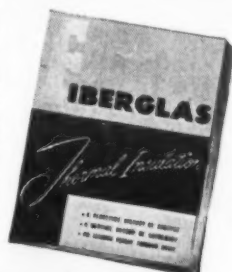
In thermal efficiency, it has a conductivity of .25 to .30 (depending upon the density) at 70° F. mean temperature. This high resistance to heat flow, combined with almost negligible heat capacity, permits close control of temperatures.

Fiberglas, being inorganic, is highly moisture-resistant, picking up less than 1% by weight under high humidity conditions, and dries out without harm. It is odorless and does not pick up odors in service. It provides no sustenance for vermin. It will not corrode, nor is it corrosive to aluminum or steel in the presence of moisture. And Fiberglas has mechanical strength—doesn't settle,

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If you produced home freezers before the war, or are thinking about entering this promising field when materials again are available, write for your free copy of the new "Fiberglas Thermal Insulation" booklet... Owens-Corning Fiberglas Corporation, 1848 Nicholas Bldg., Toledo 1, Ohio. In Canada, Fiberglas Canada Ltd., Oshawa, Ontario.



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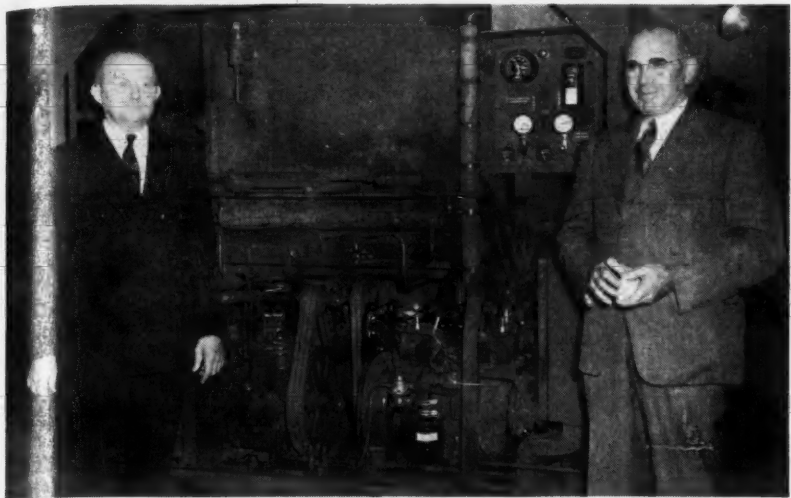
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On the 'Road to Tokyo'



Just before the first model of the unit for the new two-temperature 125-cu. ft. portable refrigerator made for the Quartermaster Corps came off the "Road to Tokyo" line at Universal Cooler Corp., Factory Manager A. E. Knapp and President Frank McNeal gave it a final inspection. Gasoline-powered, the units will maintain 10° F. for frozen foods and 35° for perishables in the cabinets produced by prime contractors.

Refrigeration Vital In Production of Synthetic Chemicals

TALLANT, Okla.—Through use of refrigeration the Cities Service Oil Co. is producing formaldehyde, methanol, and related chemicals in moderate temperature and pressure systems which eliminate the need for expensive forgings and other scarce materials required in conventional high pressure synthetic chemical processes, reports the *Frick System*, the Frick Co.'s magazine.

At plants here and in Oklahoma City and Seminole, Okla., Cities Service converts methane and other natural gas hydrocarbons directly to formaldehyde by air oxidation. Cities Service is the largest producer of formaldehyde by this process. In the production of formaldehyde an

equal tonnage of methanol is produced simultaneously, along with lesser quantities of other materials.

"These products are produced in admixture—as a crude chemical—by the controlled partial oxidation of natural gas hydrocarbons," states Frick. "The crude chemical product must then be separated by fractionation into its major constituents—formaldehyde solution, methanol, acetaldehyde, and methyl acetone solvents. These fractions are further refined to commercial specifications."

Refrigeration equipment at the Tallant plant includes a 6-cylinder Frick AV ammonia compressor, 3½ in. by 3 in., which is connected to a 16 in. by 18 ft. type MS condenser and a 16 in. by 15 ft. type MS water cooler. The cooler is under float valve control, and a 1¼ in. back-pressure valve prevents possible freezing of the water in the tubes of the cooler.

At the Oklahoma City plant a 4 in. by 4 in. compressor operating at 400 r.p.m. discharges into an HS condenser shell 8 in. by 18 ft. There is also a 12 in. by 12 ft. gas chiller built to withstand 350 lb. working pressure and a heat exchanger consisting of three shells 6 in. by 22 ft. long, which are used for cooling formaldehyde from 354° F. to 32° F.

Heat exchanger shells have copper tubes and are of welded construction. The chiller operates as part of the ammonia system and is made of steel. Deflector type separator with steel shell and copper is also employed, along with float control and by-pass.

A cooling tower is used for condensing water, but since cold well water is used for make-up the temperature may run lower than air. The system cools up to 96,000 cu. ft. of gas per hour.

The plant at Seminole is a duplicate of that at Oklahoma City, except that the compressor is driven by a Frick natural gas power unit.

Million 'Frozen' Rivets Required for B-29's

SEATTLE, Wash.—Sub-zero treatment of rivets going into the new Boeing B-29 Superfortresses represents one of the most important steps in industrial science today.

The new aerial dreadnaughts which carry more bomb loads higher, faster, and farther than any other bomber in the world are 98 ft. long and 27 ft. high. Their wing span is 141 ft. 3 in.

Not including duplicate installations, each plane calls for 40,450 different kinds of parts, a high percentage of which are riveted during fabrication and later riveted again into final assembly. More than one million rivets of 200 different types are used.

Rivets, in the condition they come from the manufacturer, are not yet ready for use. They are heat-treated

at the Boeing plant in a salt bath at 920° F. This is followed by a quench in cold water, and by another cold bath in alcohol methanol.

Express transfer then takes them into the big Sweden freezer units. There are three of these at the main

Seattle No. 2 plant. Here they are kept at 40° below zero F. until the riveting teams send for them.

The holding freezers are divided into six major sections containing 24 drawers, each accommodating 30 lbs. of rivets. From these storage

cabinets they are distributed to the 25 local stations throughout the plant by mobile freezing units. Newcomers often mistake them for ice cream wagons. Deliveries to the eight branch plants in the state are handled in similar manner.

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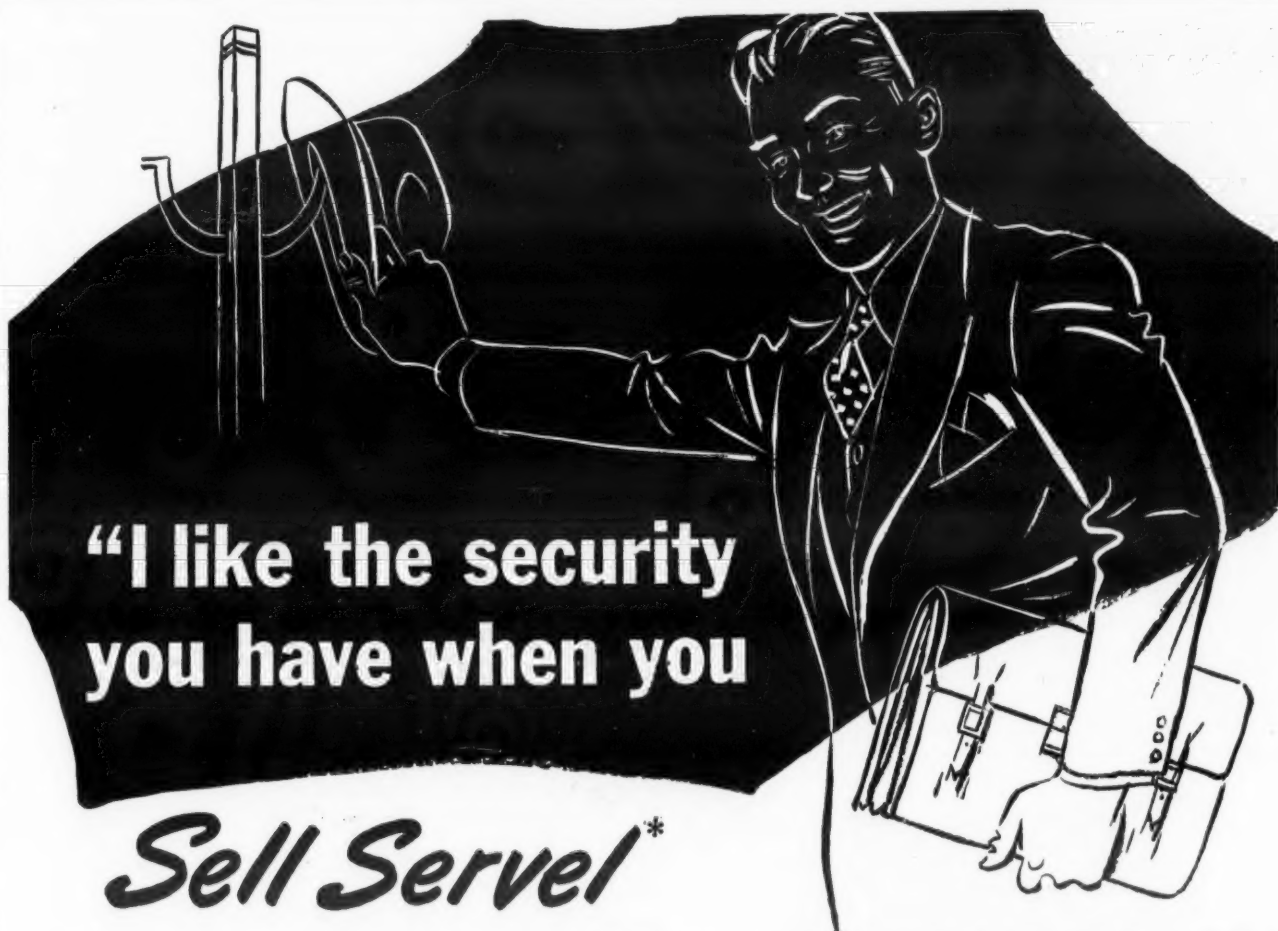
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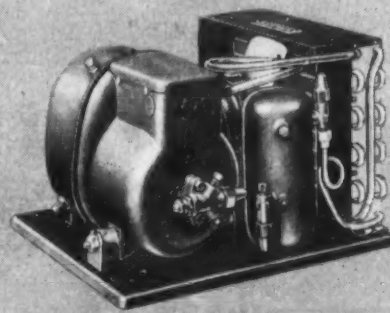
"And after the war, Servel will have new units for the new markets that are coming along, too. I, for one, am planning to 'go to town' with those Servel 'Supermetic' models. Yes, when it comes to condensing units, I'm glad I'm selling Servel!"

Such remarks are typical of many we hear from Servel dealers and distributors. If you'd like to learn more about their reasons for making them, and about the opportunities for a Servel franchise in your district, why not write today?

FREE: For information about Servel condensing units, and for an authoritative discussion of one of the most promising of post-war markets, send for your free copy of "A Study of the Farm and Home Freezer Market After the War." Address Servel, Inc., Dept. RN, Evansville 20, Indiana.

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R-12

★ Here is BOB TYLER, Vice-President on leave for service in the Army Air Forces. His host of friends in commercial refrigeration will be pleased to know that Capt. Bob has been plenty active in European war zones. Even so, he has inquired about post-war plans, the execution of which he looks forward to after the job is done over there. Tyler engineers will have a great line ready for your return, Bob.



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Army Refrigeration Problems

By P. B. Reed

Manager, Refrigeration and Air Conditioning Division, Perfex Corp.

Compressor Shaft Seals (Part 2)

Fig. 3 shows a design typical of some of the earlier attempts at a mechanical seal. A ring-shaped metal or rubber diaphragm was gasketed and secured to the crankcase and a ring of brass was soldered or clamped to the hole in the diaphragm as shown in the illustration.

A heavy spring, held in place and under compression by a cup, pressed the seal nose tightly against the shoulder on the shaft. The seal nose and the shaft shoulder were carefully and accurately machined and lapped as smooth as possible to get them to fit one another so closely that no gas could leak through.

The seal nose running on the shaft shoulder required some lubrication. In fact, with this type of seal it required considerable lubrication, for the seal nose was pressed tightly against the shaft shoulder.

Some lubrication was obtained from oil seeping out of the main bearing but since the compressor was frequently on a vacuum, the

tendency was for the oil to leave the seal rather than to flow to it.

To prevent galling and excessive wear of the seal nose and shaft shoulder, oil was directed to them from the oil pocket above the main bearing.

SEATING OR UNSEATING FORCE

If the crankcase pressure is zero pounds gauge, the seal has nothing to do except prevent the leakage of oil that would follow the shaft. The nearer that crankcase pressures stay to atmospheric pressure (0 p.s.i. gauge), the easier it is to design a seal that will hold dependably and which will require low wattage.

Conversely, if during either or both the running or idle cycles of the compressor the crankcase pressure is high or is in a deep vacuum, the job of the seal is harder.

The design of any individual seal may make it particularly adapted to holding a high pressure or a vacuum, or it may be suitable for either.

The inside pressure from the crankcase is exerting pressure on the diaphragm in the area between the seal nose and the inner edge of the clamping cup. The effective area would not be measured by the outer diameter but by the "effective" diameter.

'EFFECTIVE' DIAMETER

What percentage the effective diameter is of the total diameter depends on the stiffness of the diaphragm. The crankcase pressure times the effective area is the total force trying to push the nose off the seat (the shoulder of the shaft). Atmospheric pressure on the outside of the diaphragm is trying to keep the nose on the shaft shoulder.

If the crankcase pressure is zero p.s.i. gauge (14.7 p.s.i. absolute) and supposing the effective area of the diaphragm less the area within the seal nose is 2 square inches, then there is a force of 29.4 pounds trying

to unseat the nose. But, since there is also an atmospheric pressure of 14.7 p.s.i. absolute trying to seat it, the seating force will also be 29.4 pounds. The two will balance and no spring would be required.

Suppose the compressor went on a 20 inch vacuum (4.7 p.s.i. absolute), then the unseating force would be (2×4.7) 9.4 pounds. The seating force would still be 29.4 pounds, so there would be no spring needed if the compressor were on a vacuum since the seating force from atmospheric pressure would be more than the unseating force from crankcase pressure.

HOW STRONG A SPRING?

Now if the crankcase pressure went to 10 p.s.i. gauge or 24.7 p.s.i. absolute, then the unseating force would be (2×24.7) 49.4 pounds. The seating force still stays 29.4 pounds so there would be a difference of 20 pounds tending to unseat the nose.

To keep an above-atmospheric crankcase pressure from unseating the nose and allowing the seal to leak, a spring must be put in to help atmospheric and the force exerted by that spring must be equal to the effective area of the diaphragm less the area within the seal nose, multiplied by the highest crankcase pressure that will be experienced.

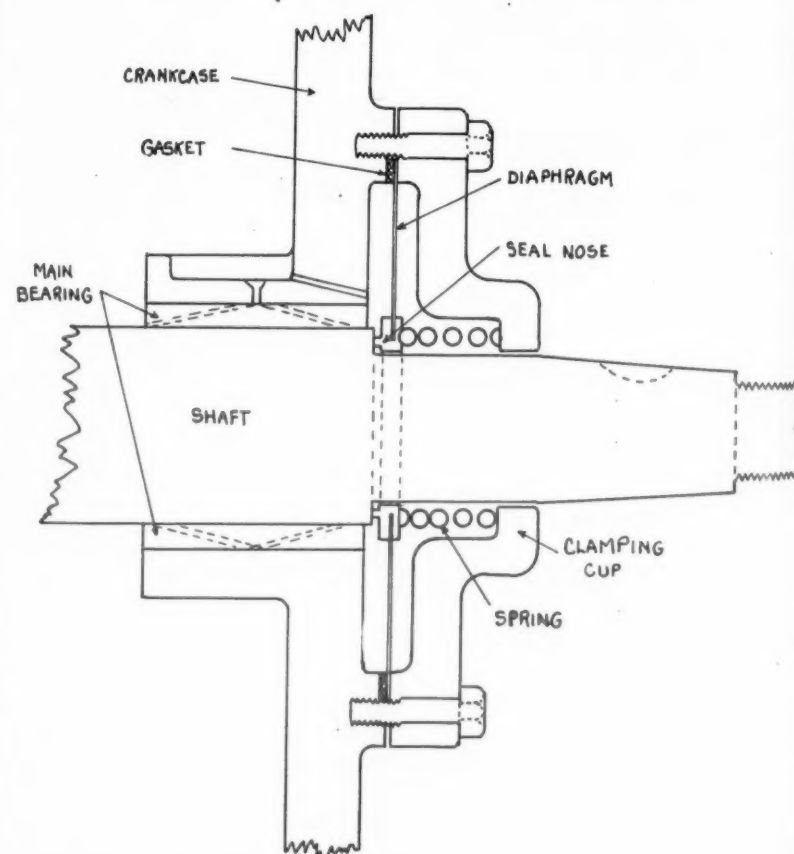
STRENGTH FOR SO₂

If the refrigerant is sulphur dioxide, the crankcase pressure could very easily run up to 60 p.s.i. gauge—stand-by on a hot day. So the spring would have to be at least a 120 pound spring just to balance crankcase pressure. Actually it would have to be a little more than 120 pounds to overcome crankcase pressure and have a little excess seating pressure.

This heavy spring would be almost offset by crankcase pressure if

(Concluded on Page 21, Column 1)

Fig. 3 -- The Diaphragm Seal



Commercial and Domestic
REFRIGERATOR HARDWARE

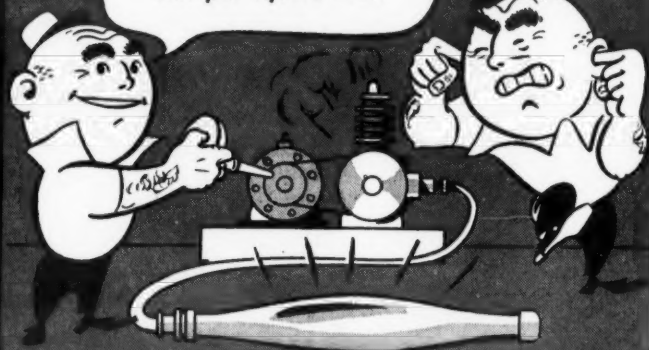


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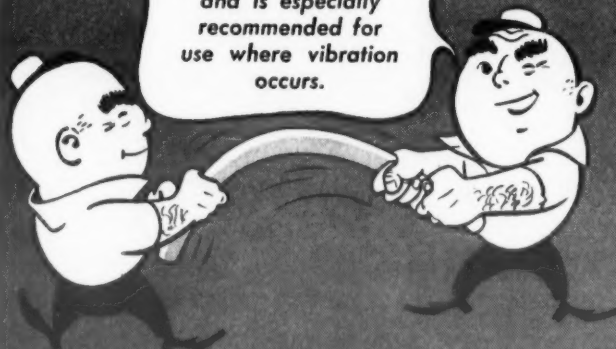
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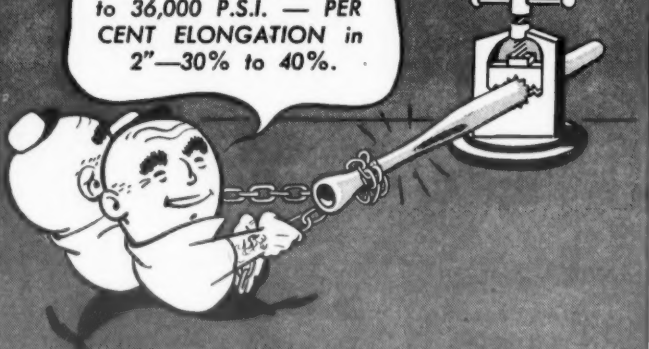
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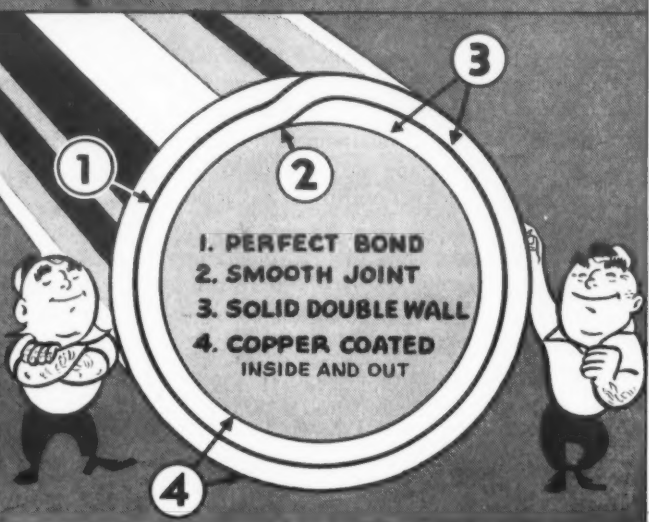
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Compressor Shaft Seal Design

(Concluded from Page 20, Column 5)
crankcase pressure were 60 p.s.i. gauge, but when the evaporator is cold the crankcase pressure would rarely be above 10 p.s.i. gauge. The difference, 50 pounds times 2 sq. in., would be 100 pounds which is the force exerted by the spring against the nose and the nose against the shaft even with normal suction and crankcase pressures.

This would cause fast wear of the nose and the shoulder on the shaft, excessive heating and high loss of current to overcome the high friction between the sealing faces—the nose and the shoulder of the shaft.

HOW TO LIGHTEN THE SPRING

The smaller the difference between crankcase and atmospheric pressure, the lighter can be the spring. At no pressure difference (0 p.s.i. gauge, crankcase pressure), the seal is balanced. Also the smaller the effective diameter, the lighter can be the spring, for the spring force is the pressure times the effective area of the diaphragm less the area within the nose.

We can't change the diameter of the shaft shoulder which is what determines the diameter of the nose. Perhaps we can reduce the effective diameter of the diaphragm by using a stiffer diaphragm or a diaphragm with a smaller total outside diameter.

If we could get the effective diameter of the diaphragm as small as the seal nose, then there would be no difference and hence no area for the crankcase pressure to act against, and no spring would be required even for crankcase pressures much above atmospheric.

'BALANCED SEAL'

This is impossible in this construction using a single diaphragm, but it can be done by using a metal bellows, and we then have what is known as a "Balanced Seal"; that is, a seal in which the crankcase pressure has no effect in seating or unseating the seal nose, and only a very light spring is used just to hold the seal nose lightly against the shoulder of the shaft.

Buehler Discusses Ways of Varying Machine Capacity

CHICAGO—Ten different methods of varying the capacity of refrigeration compressors were outlined for the recent meeting of the Chicago Section, American Society of Refrigerating Engineers, by Leon Buehler, Jr., of the Creamery Package Co. here in a paper entitled "Capacity Reduction Methods."

Four of the methods described by Mr. Buehler require no special construction in the compressor, for the capacity reduction is effected through external means, as follows:

1. Varying the compressor volume produced by multiple units through cutting out one or more compressors, or by the use of variable speed drives.
2. Throttling the compressor suction, such as with a back pressure valve.
3. Bypassing a portion of the discharge back to the compressor suction.
4. Providing auxiliary heat to evaporate the excess available liquid refrigerant to balance the load to the plant capacity.

CHANGING MACHINE DESIGN

The last three of these methods result, however, in a loss of the compressor's operating efficiency, declared Mr. Buehler, who then described the following six possible methods of reducing capacity by changing compressor design:

1. Use of variable clearance with one or more clearance pockets or clearance cylinders with movable pistons.
2. Designing a compressor with a variable stroke, i.e., the piston travels to within varying distances from the head or travels to the same point at the head but varying points at the crank end of the stroke.
3. Employment of a cylinder bypass return to suction for a portion of the stroke.
4. Holding the suction valve open.
5. Use of a multiple cylinder compressor where individual cylinders

are provided with independent heads. A connection from each head to a common discharge manifold is provided, and at least one of the connections is fitted with a check valve and connected to valved line from ahead

of the check valve to the suction line, so that when the valve is open that cylinder will discharge back into the suction and in effect be out of service.

6. A multiple cylinder compressor

designed to permit selective operation of some of the pistons while holding others stationary could also reduce capacity, but Mr. Buehler added that he did not know of any units actually using this method.

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"DAVISON'S SILICA GEL
tops all drying agents because it
gives the extra protection we need
... protection against corrosion
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They're right! Because it was developed especially for the refrigeration industry, Davison's Silica Gel has proved its ability to do more than just eliminate troubles caused by moisture.

Use of methyl chloride as a substitute for scarce "Freon" increases the corrosion hazard. You must play safe. Use the drying agent that removes acids as well as moisture... Davison's Silica Gel.

Your jobber stocks it... in factory-charged dehydrators and for refilling.



IN ADDITION TO
MAXIMUM CAPACITY
FOR MOISTURE AND
REMOVAL OF ACIDS
AND CORROSIVE
COMPOUNDS...

Davison's gives you
Instantaneous Action
Freedom from Dusting
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Canadian exclusive sales agents for DAVISON'S SILICA GEL:
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At this very moment, men may be getting messages direct from the sky 25 miles above the earth's surface. Scores of "radio-sondes" make nightly balloon ascensions into the stratosphere. One reached the fantastic altitude of 132,000 feet!

The radio-sonde is a compact radio sounding unit, borne aloft by balloon and returning to earth by parachute. It contains delicate instruments for measuring temperature, pressure, humidity, other phenomena vital for weather forecasting. It contains, too,

radio equipment for transmitting this information to receiving sets on the ground.

How would you test the radio-sonde under actual working conditions?

In test chambers, General Electric air conditioning and refrigeration equipment help reproduce the strange, unearthly "weather" of the mid-stratosphere... air of extremely low absolute humidity... with temperatures ranging down to -100° ... air so thin it exerts a pressure less than 1/100 of the atmospheric pressure at sea level!

Creating stratosphere weather was another tough job, another exacting wartime problem for G-E engineers.

In solving many of these problems, we've made air conditioning and refrigeration equipment more compact, more flexible, more efficient—adaptable to the postwar requirements of more users. Investigate! Write: General Electric Co., Air Conditioning and Commercial Refrigeration Divisions, Section 4412, Bloomfield, N. J.

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GENERAL ELECTRIC

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OPA Lists Ceilings on Additional Brands Of Electric Irons

WASHINGTON, D. C.—Several additional models of electric irons have been added to the list setting dollar-and-cent maximum prices at wholesale and retail for the commodity, announces OPA. The action was effective Dec. 11, 1944.

At the same time the notification requirement has been deleted. Prior to this action, it was required that every wholesaler notify his purchasers for resale of the new maximum prices and the conditions under which resale may be made. OPA said that the tagging requirement, also provided in the regulation, serves the purpose of notification.

The following models, whose retail prices will be at March, 1942 levels or less, are added to the list by this action. They are:

Son-Chief Electric, Inc.
Winnetka, Conn.
Waverly Tool Co.
Irvington, N. J.
Dominion Electrical Mfg. Co.
Mansfield, Ohio
Landers, Frary & Clark
New Britain, Conn.
Montgomery Ward
Chicago, Ill.
Sears-Roebuck, Chicago, Ill.
Retail Stores
Mail Order Catalog
Retail Stores
Mail Order Catalog
Retail Stores
Steam Electric Co.
St. Louis, Mo.
Superior Electrical Products, Inc.
Cape Girardeau, Mo.

Model	Description	Retail Ceiling Price, Including Federal Excise Tax
C3512M	Automatic, 1,000 watts without cord	\$ 4.50
C3618R	Automatic, 1,000 watts	5.55
W-410	Automatic, 1,000 watts	14.25
B-200	Steam Automatic, 1,000 watts	14.25
I002A	Automatic, 1,000 watts	8.40
0174X	Automatic, 800 watts	6.75
Mail Order Catalog		
86-2699	Automatic, 800 watts	5.45
20-6246	Automatic, 1,000 watts	7.50
20-6246A	Automatic, 1,000 watts	6.95
20-6246B	Automatic, 1,000 watts	7.50
20-6218	Automatic, 1,000 watts	6.95
20-6218	Automatic, 1,000 watts	7.50
425	Steam non-automatic, 600 watts with cord and equipment	9.95
205W	Non-automatic, 660 watts	3.65
220	Automatic, 1,000 watts	6.95

Orkil to Distribute G-E Major Appliances In Bridgeport Area

BRIDGEPORT, Conn.—Orkil, Inc., has been appointed wholesale distributor of General Electric appliances in Fairfield county.

Orkil, serving the Hartford area, one of the key markets of the country, will distribute G-E household refrigerators, ranges, water heaters, home laundry equipment, dishwashers, Disposalls, kitchen cabinet equipment, and cleaners. The distributor plans to open an office in Bridgeport as soon as conditions require it, for the purpose of serving dealers in the Fairfield county area.

The appointment, according to an announcement by C. A. Brewer, secretary of G-E's distribution committee, will not affect other distributor's serving the Fairfield territory with G-E traffic appliances and cleaners.

Prices of G-E Units Revised by OPA

WASHINGTON, D. C.—Revision of Order 88 under MPR 136 establishing ceiling prices for new or rebuilt refrigerator replacement units for General Electric Co. models has been announced by the Office of Price Administration.

The amendment establishes ceilings for sales from manufacturer to distributor, distributor to dealer, and dealer to consumer. Prices listed include the Federal excise tax and delivery, but \$5 may be added to the price if the units are sold with a four-year replacement contract. Sellers may also demand surrender of the unit which the rebuilt unit is to replace without making an allowance for the surrendered unit.

Ceilings for sales by General Electric Co. to distributors follow:

Model	Maximum Price For Each Unit
Flat top sealed units:	
CF1 through CF11—CFS1—CE140—FBA1	\$34.66
CF2 through CF28	34.66
CH—CJ	31.69
CE34—CE340	43.17
Monitor top sealed units:	
CK1—CG1—DK1	43.67
CK15	43.67
CK2—CK26—CK28	44.78
CK30	51.82
CK35	51.82
CA1	48.62
CA2	49.67
LK1—LK2	69.17
DR1—D15	48.22
DR2—D2	50.59
DR3—D30—DRB31—D31	50.59
DR3—DRE3—DR35—D35	63.79
SD40	61.30
FEA-1	60.75
FEA-2	64.00
Open belt-drive units:	
CB1—CB2	37.27
CB3	37.27
CD1—CD2—CD11	39.71
CD3	39.71
CM1—CM2	41.83
CM32—CM311—CM312	38.03
CM33	38.03
CM34—CM35	40.13

Distributor to dealer price ceilings are:

Flat top sealed units:	
CF1 through CF11—CFS1—CE140—FBA1	\$38.30
CF2 through CF28	38.30
CH—CJ	35.02
CE34—CE340	47.75
Monitor top sealed units:	
CK1—CG1—DK1	48.52
CK15	48.52
CK2—CK26—CK28	49.75
CK30	57.57
CK35	57.42
CA1	53.88

Model	Maximum Price For Each Unit
CA2	55.04
LK1—LK2	76.25
DR1—D15	53.27
DR2—D2	55.89
DR3—D30—DRB31—D31	55.89
DR—DRE3—DR35—D35	70.43
SD40	70.31
FEA-1	67.59
FEA-2	67.25
Open belt-drive units:	
CB1—CB2	41.13
CB3	41.13
CD1—CD2—CD11	43.81
CD3	43.81
CM1—CM2	46.11
CM32—CM311—CM312	41.94
CM33	41.94
CM34—CM35	44.39
Dealer to consumer ceilings are:	
Flat top sealed units:	
CF1 through CF11—CFS1	\$50.48
CE140—FBA-1	50.48
CF2 through CF28	50.48
CH—CJ	46.16
CE34—CE340	63.17
Monitor top sealed units:	
CK1—CG1—DK1	64.09
CK15	64.09
CK2—CK26—CK28	65.72
CK30	76.05
CK35	76.05
CA1	70.70
CA2	72.22
LK1—LK2	93.83
DR1—D15	69.80
DR2—D2	73.24
DR3—D30—DRB31—D31	73.24
DR3—DRE3—DR35—D35	92.16
SD40	91.93
FEA-1	83.20
FEA-2	89.50
Open belt-drive units:	
CB1—CB2	53.99
CB3	53.99
CD1—CD2—CD11	57.44
CD3	57.44
CM1—CM2	60.43
CM32—CM311—CM312	55.02
CM33	55.02
CM34—CM35	58.76

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THE BATTLE PROVEN
Electric
WATER COOLERS

• THE PROVING GROUNDS OF WAR offer dramatic confirmation of the ability of Cordley Electric Water Coolers to withstand hard knocks. Supplied since 1942 for shipboard use to the Navy (Contract NKs 9962) and to the Maritime Commission. These same Battle Proven Coolers are now available for essential uses on land. Write for facts.

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Manufacturers of Water Coolers For 55 Years



CLEANLINESS
DRYNESS
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You get these qualities in
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**WE ARE READY!
ARE YOU?**

YOU HAVE had your warning. The hall of Congress and political convention echo and re-echo with the command, "Get ready for the peace." W.P.B. urges, "Build your postwar samples." Statesmen, politicians, financiers and executives the world over are talking "peacetime economy." Even the typewriter strategists have joined the cry, "Get ready for peace."

What are we doing about it? At Tecumseh postwar models are well beyond the "layout" stage and some "samples" have been built. These units are designed on the same sound engineering principles that established Chieftain's leadership. Yet, they mark real progress, for Chieftain will supply a complete line of commercial hermetics, with greater flexibility of application and added safeguards for trouble-free performance, not the same old product in a new dress.

This message is directed to the progressive manufacturer of refrigeration equipment who is doing something about his company's future.

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TECUMSEH PRODUCTS CO.
TECUMSEH, MICHIGAN

Growth of Frozen Food Business & Lockers Seen as 'Revolution' With Many Effects

Prospects Outlined for Detroit A.S.R.E.

By C. Dale Mericle

DETROIT—The growth of the frozen food business and the locker industry represents a revolution in foods that will have far-reaching effects on the nation's economy and habits and is of particular importance to the refrigeration engineer, declared Wayne Carver, editor of the *Locker Operator*, who addressed the December meeting of the Detroit Section, American Society of Refrigerating Engineers.

Emphasizing the fact that the conventional method of food preservation—canning—is only a little over 100 years old and was developed chiefly because Napoleon demanded a better method of feeding his troops on the march, Mr. Carver pointed out how World War II is contributing to the growth of the frozen food business.

"A whole new concept of the meat business will come out of the war," he said. "The cost of boning and cutting of meat has been drastically cut by the big packers, who are preparing and freezing meat in huge quantities for the armed services.

"Frozen meat cuts are favored by the big chain markets, because they want to handle packaged items. While the butchers' unions will fight this revolution in meat handling, if the method proves to be sound and economically correct, it will win out. "This development will mean that thousands and thousands of refrigerated cases for frozen meats as well as many refrigerated trucks will be required," he stated.

Frozen foods may also help even up discrepancies in food prices throughout the country, believes Mr. Carver. He cited the great variations in the price of milk between the milk-producing centers, such as Wisconsin, where milk may retail for 10 cents a quart, and non-producing consumer areas, such as Florida, where the price may hit 18 or 20 cents. Frozen milk, produced by the method recently developed at the University of Pennsylvania, could cut the price in areas distant from producing areas.

Developments such as these will require a tremendous increase in refrigerated transport, he pointed out.

A most important part of the "food revolution" is the expected widespread use of home and farm food freezers (or "lockers" as the locker industry prefers to call them). Biggest selling item in this postwar market will probably be the "home freezer," selling from \$125 to \$175 with a capacity around 5½ or 6 cu. ft., and costing about \$1 a month to operate, said Mr. Carver.

Two other classes of frozen food units are designed for the farmer. The "farm freezer" is designated as a low temperature food storage cabinet of 16 cu. ft. or more with a separate freezer compartment. This type has a plate coil or a fan in a compartment at one end to provide quick freezing facilities.

A "complete farm unit" will also be offered the rural market, according to Mr. Carver. This will be a walk-in chill room 6 by 8 ft. held at 36° to 40° F. with a 6 to 8-cu. ft. freezer compartment in one corner.

The widespread use of home and farm freezers is not considered a threat to locker operators, declared Mr. Carver. For one thing, he said, many locker operators intend to retail these units to their customers. In addition, locker plants will serve as food processing centers, especially for farmers, who don't particularly care to do their own slaughtering.

'Engineers Have Duty To Advise Operators'

"Don't tell a locker operator how cheaply he can build a plant," suggested Stuart M. Smith, president of the Michigan Food Locker Association, who also addressed the Detroit A.S.R.E. Section.

"As this business grows, refrigeration engineers have a duty to advise locker operators carefully. We don't have time to be a refrigeration engineer. We don't want to bother with the refrigeration plant," he declared, emphasizing that the operator wants the refrigeration system to operate with as little attention as possible so that he can devote himself to servicing his customers.

Citing the growth of the locker industry in Michigan, which had only four plants in 1938, but now has 120, Mr. Smith predicted that there may be 1,000 plants operating in the state eventually.

"Incidentally, one of the biggest hazards in locker plants today is the losing of patron's products. Although locker operators don't usually care to talk about this, it does happen occasionally," he declared.

"Patrons will tell you when they lose something, but not when they find something in their lockers."

In two plants operated by Mr. Smith in Pontiac, Mich., a checking system to prevent such mistakes has been developed. This plan calls for the operator or workman to list the food to be processed each day and then place a green slip in each locker that is to receive food produce following the day's work.

When the food is frozen and ready to be stored in the lockers, it is taken to the individual lockers, but is not put in unless there is already a green ticket in the locker. Should there be more food than space in the locker (and that frequently happens, Mr. Smith said), the surplus is noted on the slip, which is filed in the front office, while the excess is stored by the operator pending disposal in some manner by the patron.

Mr. Smith then outlined his

"dream" locker plant, which, he said, will be of a single-story construction all on one floor, providing a cheaper and more efficient operation. The plant will incorporate a blast

tunnel freezer and the whole plant will be fitted with a mono-rail system. A simple method of defrosting, probably water defrosting, will be included."

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IN PEACE...WAR...POST-WAR

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Dept. 193-11, First National Bank Bldg.
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Please give me the facts about the Balsam-Wool Pneumatic System with PNEU-PRO FIBRE for refrigerator insulation.

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PNEUMATIC SYSTEM WITH PATENTED PNEU-PRO FIBRE

Since 1935 A Decade of Experience

The Locker Operator has profited by the many firsts produced by MASTER in the past ten years. That's why operators everywhere prefer MASTER. You too can profit by insisting on



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Solidly built of steel by men who pioneered the industry. They have features that assure profitable and economical Locker plant operation. It costs no more to get the "Choice of the Industry." If you want lockers that meet your every requirement—get MASTER.

Write for full particulars

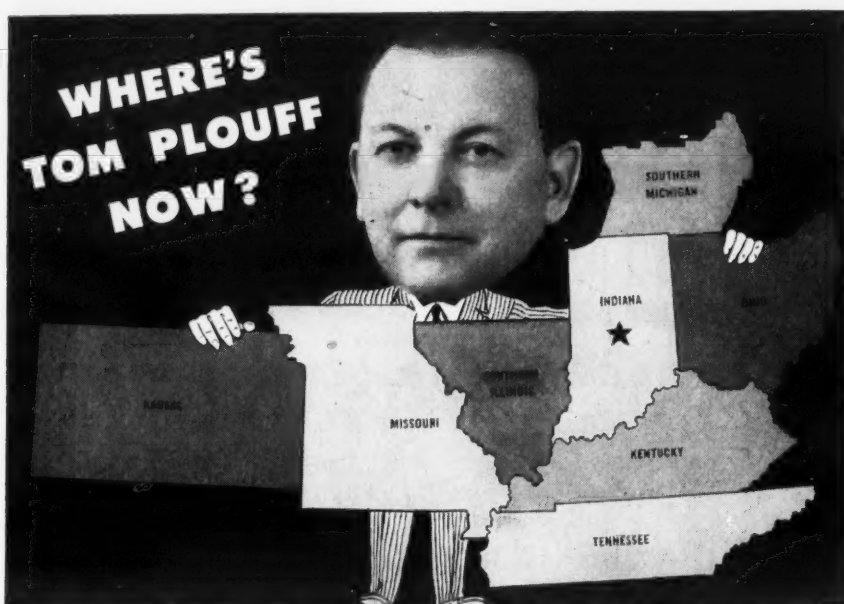
Safeguard your investment by getting the facts about MASTER before you buy any locker. It's the first-cost, last-cost locker.

Endorsed by and sold through distributors of refrigeration and insulation.

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Member of Frozen Food Locker Manufacturers and Suppliers Ass'n. organized for your protection.

Over 700,000 Master Food Conservators in Use



● If you're wondering where your friend, Tom Plouff, can be reached today, listen to this...

From now on, Ansul Representative Tom Plouff will be located at Indianapolis, Indiana, where he will be giving excellent Ansul service to the refrigera-

tion industry in his new home state as well as Missouri, Kansas, Ohio, Kentucky, Tennessee, Southern Michigan and Southern Illinois.

If you're in his territory, Tom Plouff will be very happy to serve you at any time.

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ANSUL
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Agents for Kinetic's "FREON-12" and "FREON-22"
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TWENTY-NINE YEARS OF KNOWING HOW

New Uses for Neoprene Seen In Appliances

WILMINGTON, Del. — Increasing use of neoprene, synthetic rubber produced by E. I. du Pont de Nemours & Co., can be expected in electrical appliances and many other fields after the war, according to a du Pont forecast.

Refrigerator door seals may be made of neoprene, instead of natural rubber, because the latter is deteriorated by butter fats and greases, the company believes. Postwar washing machines, ironers, vacuum cleaners, and other household equipment may have parts of neoprene—such as gaskets and belts—which will materially decrease the nuisance and expense of repairs, say du Pont officials.

Although neoprene will continue to cost more than natural rubber after the war, the price will be substantially lowered through increased production and improved processing methods.

Watson Named Buyer for Westinghouse In Dallas

DALLAS, Tex.—Austin B. Watson has been named purchasing agent for the newly established purchasing department of Westinghouse Electric Supply Co., Dallas. Mr. Watson joined Westinghouse in 1928 as an office boy in the Dallas office. In 1929 he advanced to statistics and general accounting and two years later was promoted to the stock control and service departments.

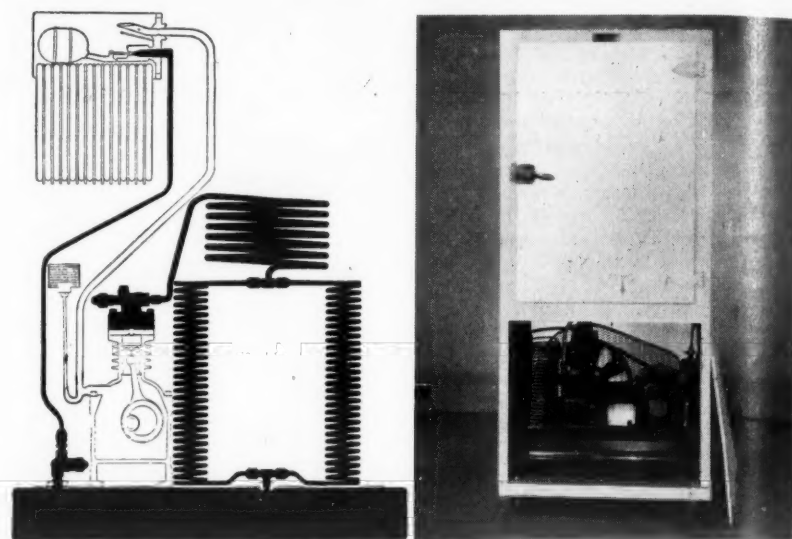
Servicing Frigidaire Open-Type Systems

Editor's Note: The material in this series of articles was prepared through the cooperation of the Frigidaire Division of General Motors Corp. service department. It is thus authentic information on service procedures for Frigidaire household refrigerators employing the open-type reciprocating unit.

While the information in this series treats specifically of the household refrigerator, it is worthwhile to know that the same type of system was used in ice cream cabinets, water coolers, beverage coolers, and other commercial refrigeration equipment, and the information can be applied in servicing such equipment.

Instalment No. 1

1—Low Side Float Used In Early Models



It should be kept in mind that in preparing this series of articles it was taken for granted that the readers are all more or less familiar with the fundamentals of refrigeration. By fundamentals are meant, the cycle of operation, the names of parts, their location, their construction, and their functions in the system.

Before going into the actual service operations, there is one very important point to remember—the low side float was used in early model household cabinets (see Illustration No. 1)—and also in ice cream cabinets, water coolers, beverage coolers, and other commercial equipment. It should be kept in mind that although a household cabinet is used to illustrate service operations, they can also be applied to any of the previously mentioned equipment as well.

Remember that the illustrated cycle of operation is common to all low side float systems, the only difference being in the cabinet or space to be cooled, and in the desired temperatures.

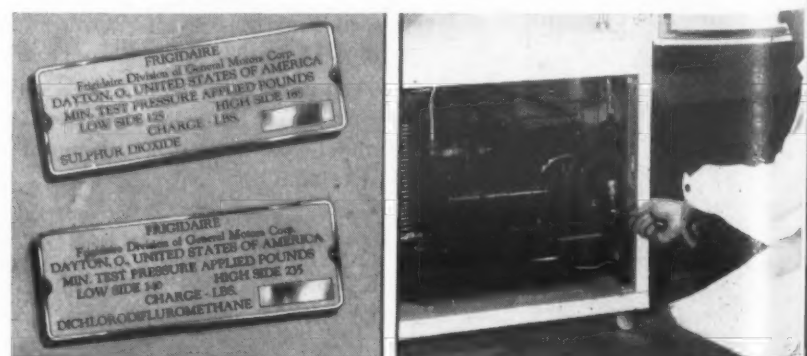
2—Know These Service Operations

Here are the Service Operations with which service men should be familiar:

1. Checking for refrigerant leaks.
2. Checking refrigerant pressures.
3. Adding refrigerant.
4. Purging the system.
5. Adding oil.
6. Adjusting low pressure temperature control.
7. Changing float valves.
8. Locating and replacing plugged strainers.
9. Replacing flapper valves.
10. Replacing syphon seals.
11. Replacing compressor bodies.

These are the service operations most frequently encountered on reciprocating systems.

3—Checking for Refrigerant Leaks



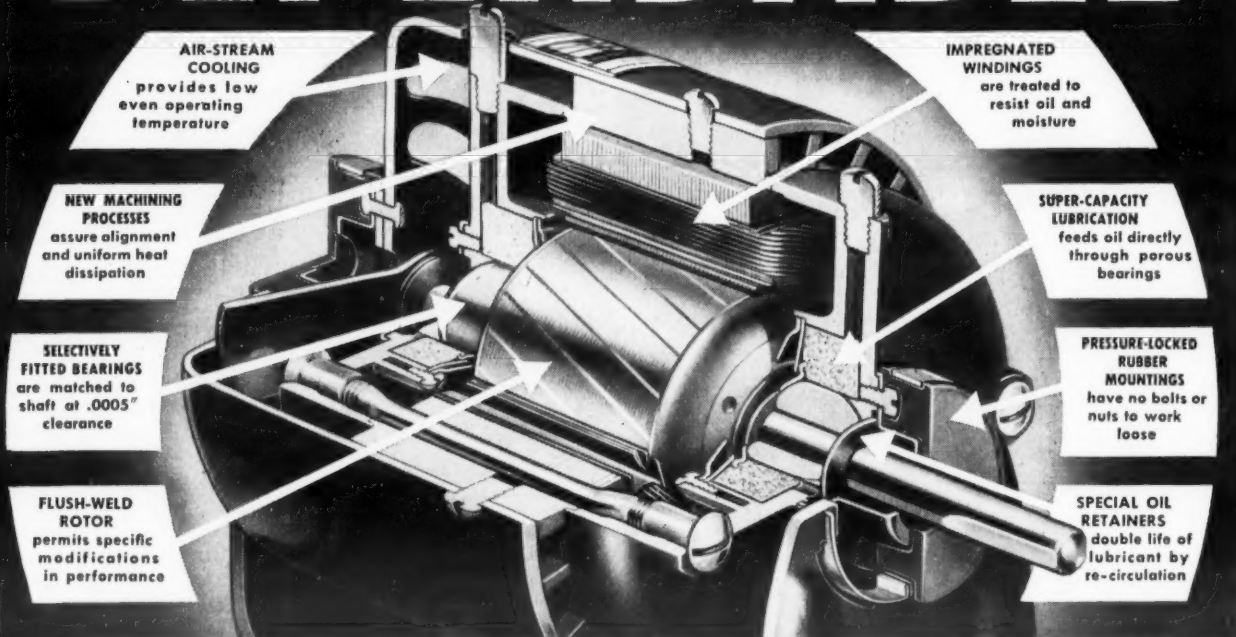
First, find out what kind of refrigerant is in the system. This is a very important step. Regardless of the kind of refrigeration system or equipment worked on, always determine the kind of refrigerant used before doing anything else.

To do this, look on the compressor base, and if there isn't a refrigerant identification tag there, crack a flare slightly, as shown, and notice the odor.

Most service men are familiar with the difference between SO_2 and "Freon-12." The high-sounding name of dichlorodifluoromethane is the chemical name for "Freon-12," which is used from now on.

(Continued on Page 25)

DEPENDABLE



Redmond MICROMOTORS CREATED FOR POSTWAR PRODUCTS



TAKE a look at the fine features in this brand new line of shaded pole Micromotors for a twentieth horsepower and less. Here's the latest word in engineering dependability in small motors.

Check the tailor-made performance in the patented Flush-Weld rotors. Spot the precision, balance and quiet operation.

Examine the new simplicity in Pressure-Locked rubber mountings that have no bolts or nuts to work loose.

Study the compact design resulting from Redmond Air-Stream cooling.

Inspect the spring tension centered porous bronze bearings that filter the lubricant, super-capacity oil reservoirs for protecting bearing life, micro-tolerances, impregnated windings, and high-silicon electric lamination steel.

Then look into the prideful craftsmanship that's inherent in every part and step of construction.

You should write us today for all the details. Ask about the Type "T" Micromotors.

A. G. Redmond Company



OWOSSO, MICHIGAN, U. S. A.

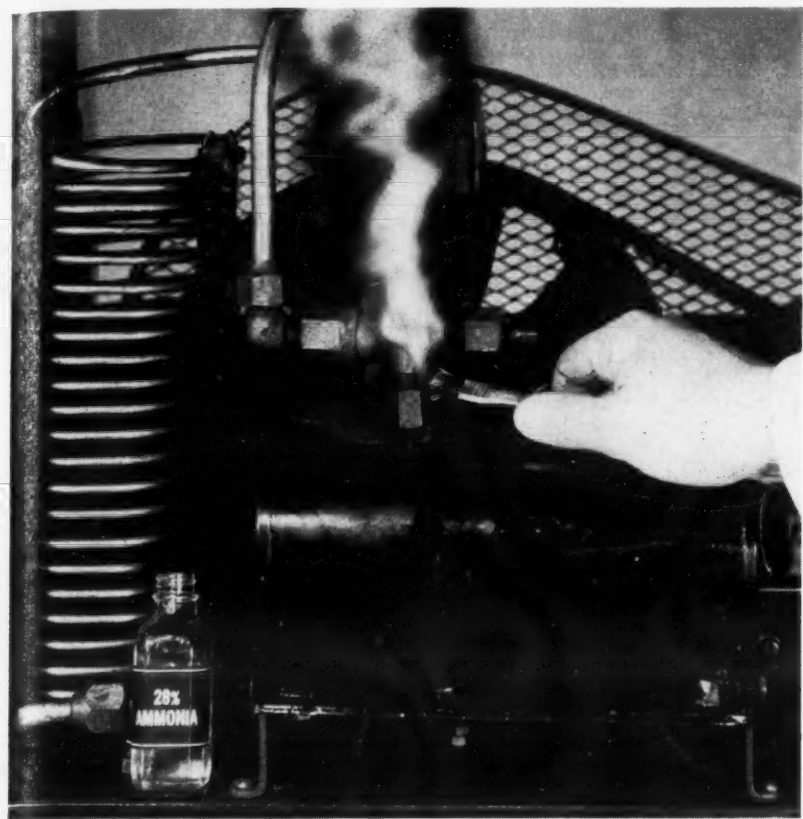


Composite sketch of Redmond facilities with over 5 acres of floor area



Servicing Frigidaire Systems

4—Using Ammonia In Leak Test

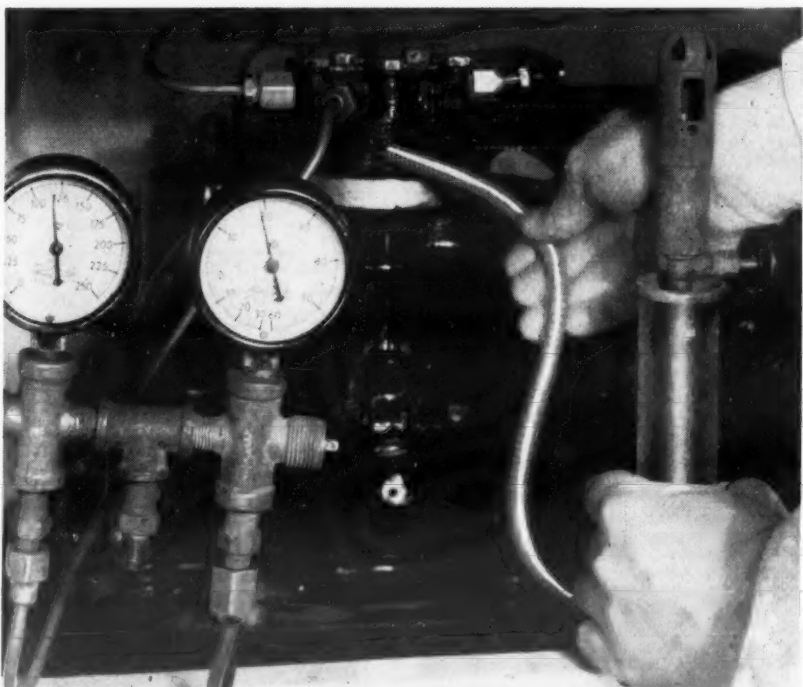


Having determined the kind of refrigerant used in the system, the next step is to use proper Testing Equipment for locating the source of the refrigerant leak.

For checking leaks in systems using SO_2 , a 28% ammonia solution is used; while a standard Halide Leak Detector is employed for "Freon-12."

This ammonia test is shown in Illustration No. 4, and the Halide Leak Detector in Illustration No. 4A.

4A—Testing With Halide Leak Detector



When working on SO_2 systems, a swab is immersed in the 28% ammonia solution and held near the suspected or possible point of the leak. Escaping SO_2 will be indicated by a white "smoke." When checking systems using "Freon-12," light the torch of the Halide Detector and hold the end of the flexible snout, or sampling tube, as it is properly known, near the suspected leak. The presence of "Freon-12" will be indicated by a change in the color of the flame—green in case of slight leak—purple if the leak is extreme.

When the leaks are detected, proceed to tighten the flange or flare nut, as the case may be, or replace the inoperative part that is causing the difficulty.

Canadian Packer Uses Refrigerator Scow

VANCOUVER, B. C., Canada—British Columbia Packers, Ltd., have now placed their new refrigerator scow in operation. The scow is 32 feet by 85 feet, on which is constructed an insulated house, 25 feet by 55 feet inside measurement, and a machinery compartment 27 feet by 8 feet.

According to information received from the packing company, the capacity of the cold room is 200,000 pounds of frozen fish. A temperature of 0°F. is maintained, while the refrigeration equipment consists of a $4\frac{1}{2}$ by $4\frac{1}{2}$ twin cylinder Baker ice machine driven by Ford-Mercury gas engines.

Dario de la Garza Joins Carrier International

SYRACUSE, N. Y.—Dario de la Garza, long identified with foreign advertising and sales promotion, has joined the Carrier International Division as advertising manager.

Former member of Colgate-Palmolive-Peet Co.'s foreign advertising department, Mr. de la Garza also served for eight years as foreign advertising and sales promotion manager of Servel, Inc. More recently he has been identified with the National Export Advertising Service of New York.

Born in Mexico City, Mr. de la Garza has been active in Latin-American trade promotion and advertising circles for 15 years.

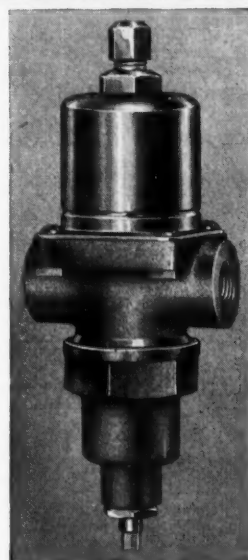
A M I N C O WATER REGULATING VALVE

Quiet

No Chatter

Practically friction-free

Maximum flow with minimum head pressure differential



Double Bellows Seal

Removable Body Seat

For all refrigerants—except ammonia

Standard connections $3/8'' \times 3/8''$ F.P.T.

Pressure Controlled

No. 614

Amino No. 614 water valve regulates the amount of water passing through water-cooled condensers. . . .

This valve is helping to keep systems in tip-top condition and because of its close control action it provides insurance of longer life for water-cooled condensers.

Sold, as always, through jobbing channels, it is an invaluable aid to the service-man concerned with keeping installations operating at full efficiency.

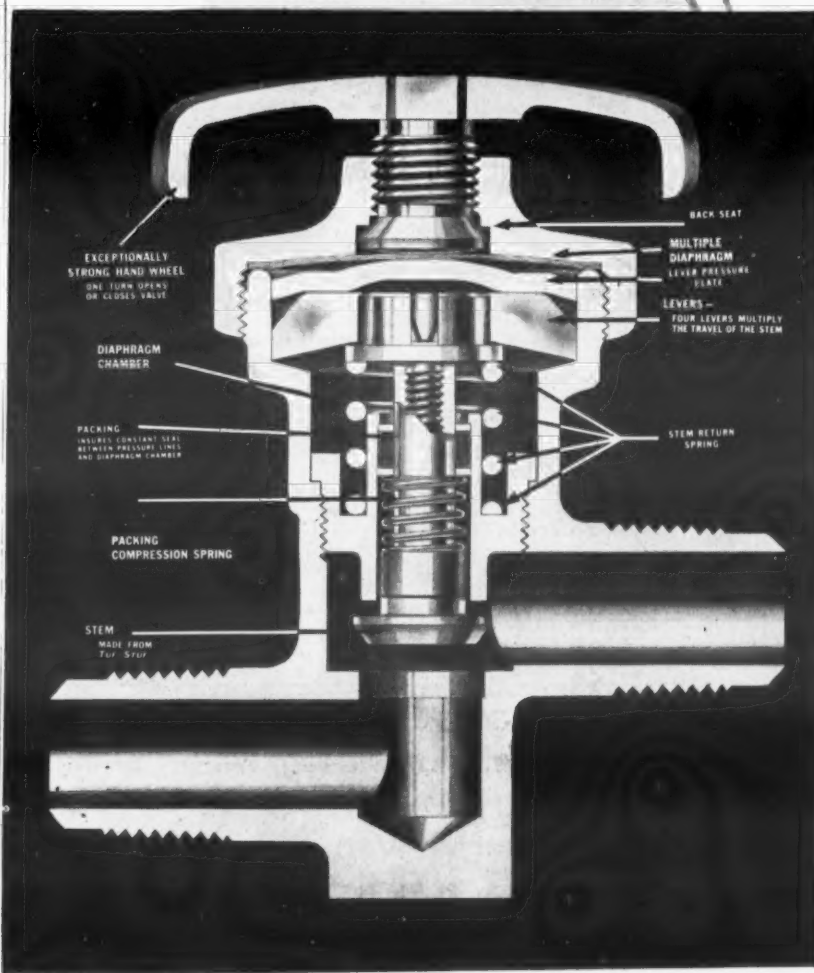
For more details see Bulletin No. 15.

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George I. Boone, 739 G. M. Bldg., 1775 Broadway, New York 19, N. Y.
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Positive sealing at three essential points in the valve is adequately provided for—a back seat with valve in open position,—the multiple diaphragms,—and a packing around the stem. (This packing insures constant seal between pressure lines and diaphragm chamber.)

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Valves are furnished in two-way, three-way, and angle type—flared or solder type ends—and in complete range of all necessary sizes.

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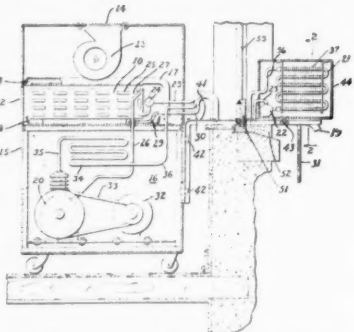
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PATENTS

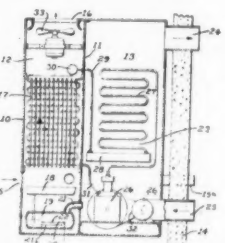
Weeks of Nov. 14 & 21

2,362,698. REFRIGERATING APPARATUS. Harry B. Hull, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Oct. 24, 1934, Serial No. 749,773. 9 Claims. (Cl. 62-129.)



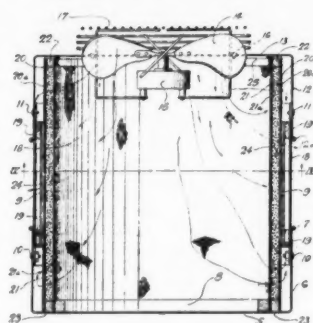
1. In a room or the like, a window, a false window sill, an air conditioner, said air conditioner including a bracket extending through said window sill, said air conditioner comprising an evaporator within the room, and a condenser mounted on the bracket without the room.

2,362,729. REFRIGERATING APPARATUS. Nelson J. Smith, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Jan. 4, 1934, Serial No. 705,187. 8 Claims. (Cl. 62-129.)



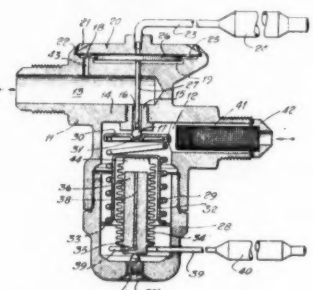
1. An air conditioning apparatus for an enclosure, an evaporator exposed to the air within said enclosure, a refrigerant liquefying unit in said enclosure insulated from said air and connected to said evaporator, means for creating a current of air past said refrigerant liquefying unit and discharging the current outside said enclosure, drain means for moisture extracted from the air within said enclosure by said evaporator, and means for conveying moisture from said drain means to the exterior of said enclosure and evaporating said moisture in said exterior, and including a wick-like member exposed to the atmosphere outside of said enclosure, means for distributing said moisture on said wick.

2,362,933. AIR CONDITIONING APPARATUS. Harold William Schaefer, Chicago, Ill., assignor to The Harry Alter Co., Chicago, Ill., a corporation of Illinois. Application March 8, 1941, Serial No. 382,325. 8 Claims. (Cl. 183-36.)



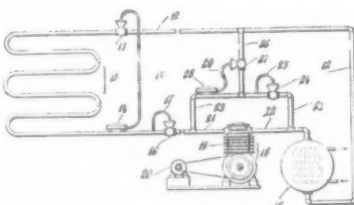
1. In an apparatus of the character described, a casing comprising a base member having an upstanding annular flange, spaced brackets secured to said flange having upwardly extending inwardly offset portions, a centrally apertured top member having a depending annular flange with its lower edge spaced from the upper edge of the first mentioned flange, a grille extending between the said flanges and secured between the inner faces thereof and said brackets, a motor driven fan carried by the top member and positioned in the aperture therein to draw air into the casing and discharge it therefrom through said grille, and a filter bed of odor-absorbing material extending lengthwise of the casing and positioned adjacent said brackets.

2,363,010. REFRIGERANT CONTROL SYSTEM. Harold J. Matteson, Glendale, Calif., assignor to General Controls Co., Glendale, Calif., a corporation of California. Application April 29, 1941, Serial No. 390,914. 4 Claims. (Cl. 62-127.)



1. In a system for cooling a space by vaporization of liquid refrigerant in an evaporator; a valve controlling passage of the refrigerant into the evaporator; a spring biasing said valve toward closed position; thermostatic means effective to open the valve, against the force of said spring, in accordance with the temperature of the refrigerant adjacent the outlet of the evaporator, and acting to increase the valve opening with increase of temperature; and means, responsive to the temperature of the refrigerant adjacent an end of the evaporator, for varying the force of said spring in accordance with the temperature of the refrigerant, the spring force being increased with increase of temperature.

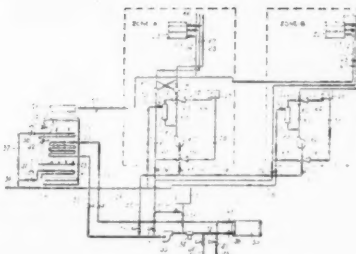
2,363,273. REFRIGERATION. Robert W. Waterhill, Montclair, N.J., assignor to Buensod-Stacey, Inc., New York, N.Y., a corporation of Delaware. Application June 2, 1943, Serial No. 489,368. 5 Claims. (Cl. 62-8.)



Wilson ZEROSAFE Reach-In
Sectional Model RL-60 for the
Storing and Dispensing of
Frozen Foods.

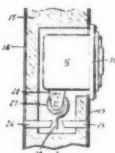
1. A refrigerating system comprising an evaporator, a compressor, a condenser, and lines permitting a circulation of refrigerant between said elements; means for regulating the flow of liquid refrigerant from said condenser to said evaporator in response to variations in the heat load affecting the latter element; means for by-passing refrigerant vapor from the discharge side of said compressor to the inlet side thereof whereby to maintain the pressure at the inlet side above a predetermined minimum; and means for by-passing refrigerant liquid from said condenser to the inlet side of said compressor whereby to cool vapor by-passed from the discharge side of said compressor.

2,363,294. AIR CONDITIONING SYSTEM. Willis H. Carrier, Syracuse, N.Y., assignor to Carrier Corp., Syracuse, N.Y., a corporation of Delaware. Application Aug. 12, 1939, Serial No. 389,749. 3 Claims. (Cl. 257-3.)



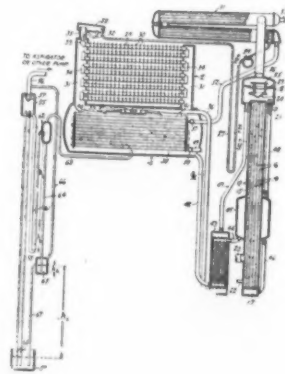
1. In an apparatus of the character described for conditioning a plurality of areas, a conditioner remote from said areas, means for supplying air to be conditioned to said conditioner, a plurality of induction units in said areas, at least, one of said units serving each area to be conditioned, conduit means comprising tubes of a diameter of the order of six inches and connecting said units with said conditioner, means for delivering conditioned air for ventilation from said conditioner into said conduit means and for routing said conditioned air therethrough at a static pressure in excess of 1" water gauge and at a velocity of the order of 3,000 to 5,000 feet per minute, means in each of said units including a plurality of nozzles for discharging said conditioned air within said units at relatively high velocity, means for supplying within the units other air from the conditioned areas induced by the high velocity discharge of conditioned air within the units, said other air being induced in volume sufficient when mixed with the conditioned air to take care of the circulation requirements of the conditioned areas whereby the use of return ducts to said conditioner is eliminated and said tubes limited in size to the ventilation requirements of said areas, means for discharging said conditioned air and said induced air from each unit into the area served thereby, means for passing a conditioning medium in heat exchange relation with said air passing through said conditioner, and means for passing conditioning medium in heat exchange relation with air in said units.

2,363,375. BUTTER CONDITIONER. Albert F. Wild, Scotia, N.Y., assignor to General Electric Co., a corporation of New York. Application Sept. 3, 1942, Serial No. 475,222. 3 Claims. (Cl. 257-3.)



1. In a refrigerator cabinet of the type having an outer wall, an inner wall defining a food-storage compartment, thermal insulation between said walls for facilitating the maintenance of a difference in temperature between the inner and outer walls, means for refrigerating the food-storage compartment, a food-storage receptacle for butter or the like arranged in said cabinet, a heat-conductive heat-responsive member in thermal relationship with said receptacle, and means for causing said member to move into heat-exchange relationship with said outer wall at receptacle temperatures below the desired value and for moving into heat-exchange relationship with said inner wall at temperatures above said desired value.

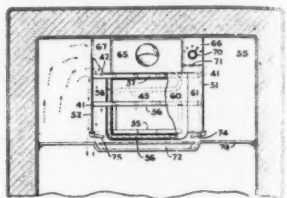
2,363,381. REFRIGERATION. Philip P. Anderson, Jr., Evansville, Ind., assignor to Servel, Inc., New York, N.Y., a corporation of Delaware. Application Aug. 3, 1940, Serial No. 350,883. 5 Claims. (Cl. 62-119.)



1. An absorption refrigeration system having a generator and a condenser adapted to operate at one pressure and an evaporator and absorber adapted to operate at a lower pressure, and connections between the aforementioned parts to provide circuits for circulation of refrigerant and absorption liquid, said connections including a conduit connected to one of the parts at said one pressure and to another of the parts at said lower pressure and through which liquid is adapted to flow, the liquid in said conduit serving to maintain the pressure differential between the parts connected thereby, and a

trap formed in said conduit arranged to receive liquid, the liquid flowing from said trap by siphon action when a predetermined quantity has accumulated therein, the successive bodies of liquid siphoned from said trap segregating gas passing into said conduit during the periods when gas can flow through said trap, the gas segregated between the successive bodies of liquid being carried by the latter through said conduit from the said one part to said other part.

2,363,385. REFRIGERATION. Milo E. Bixler, North Canton, Ohio, assignor to The Hoover Co., North Canton, Ohio, a corporation of Ohio. Application June 17, 1939, Serial No. 279,609. 26 Claims. (Cl. 62-119.5.)



23. A chilling unit construction for refrigerating systems comprising an insulated ice freezing chamber housing having an uninsulated wall, a movable foodstuffs refrigerating drawer mounted adjacent the uninsulated wall of said housing, a cooling unit including a low temperature coil within said housing for refrigerating (Concluded on Page 27, Column 1)

1944 Refrigeration Supply Catalog

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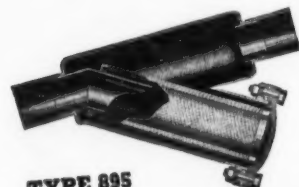
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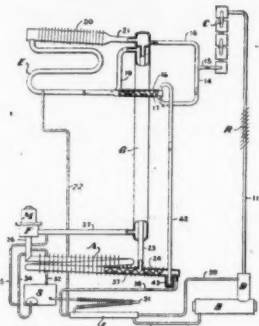
Models in sizes and multiples of sizes to meet every conceivable need.

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Patents (Cont.)

(Concluded from Page 26, Column 5)
the interior thereof and a high temperature coil in contact with said uninsulated wall for cooling said movable drawer, and means for leading refrigerant from said low temperature coil to said high temperature coil.

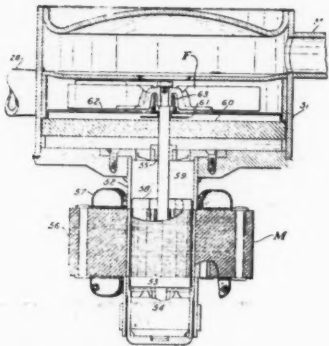
2,363,399. REFRIGERATION. Curtis C. Coons, North Canton, Ohio, assignor to The Hoover Co., North Canton, Ohio. Application Oct. 2, 1939, Serial No. 297,508. 15 Claims. (Cl. 62-119.5.)



1. Absorption refrigerating apparatus comprising an inert gas circuit including an evaporator and an absorber, a solution circuit including a generator and said absorber, a condenser connected to receive refrigerant vapor produced in said generator, a pre-cooler connected between said condenser and said evaporator, means for conveying inert gas from said inert

gas circuit and for flowing it through said pre-cooler, a second absorber connected to said solution circuit to receive strong solution, and means for flowing inert gas discharged from said pre-cooler through said second absorber.

2,363,400. REFRIGERATION. Curtis C. Coons, North Canton, Ohio, assignor to The Hoover Co., North Canton, Ohio, a corporation of Ohio. Application Oct. 11, 1941, Serial No. 414,593. 15 Claims. (Cl. 62-119.5.)



1. A refrigerating apparatus of the type in which the internal pressures vary during operation comprising, a power unit for circulating mediums in the apparatus, said power unit including a motor rotor submerged in a lubricant, and a porous plate having capillary interstices separating the rotor from other parts of the apparatus whereby refrigerant dissolved in the lubricant will not carry the lubricant with it to other parts of the apparatus as the internal pressures vary.

GENERAL ELECTRIC commercial refrigeration distributor, near New York City has need for service manager and service repair men. Excellent opportunity for experienced men. Positions permanent. State experience and salary desired. Box 1647, Air Conditioning & Refrigeration News.

SALES REPRESENTATIVE. Refrigeration firm doing large export business has opening for Spanish-speaking representative with good experience refrigeration sales work. Write giving full details, experience, and references. Box 1634, Air Conditioning & Refrigeration News.

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MANUFACTURER'S REPRESENTATIVE. Commercial refrigeration application engineer, nine years with one company. Experience as commercial manager, contacting dealers and distributors and direct selling. Would travel out of New York office and represent manufacturer exclusively or sideline. Can finance self and carry stock if necessary. Box 1641, Air Conditioning & Refrigeration News.

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WANTED ONE American Injector Co. Vacuumator with check valve, with or without drier. **ELECTRIC REFRIGERATION CO.**, 97 Weir St., Taunton, Mass.

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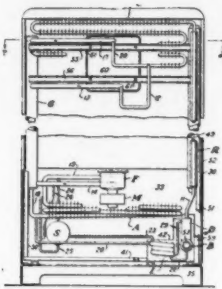
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NEW ORLEANS, Louisiana. Old established refrigeration firm wants distributorship for walk-in coolers, display cases, milk coolers, and other suitable items. Reply to Box 1648, Air Conditioning & Refrigeration News.

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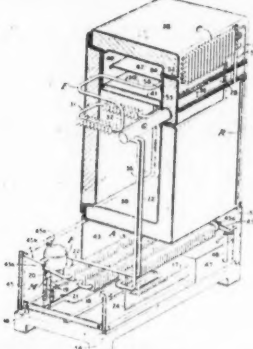
FOR SALE. Electrical Shop. Refrigeration Service; domestic and commercial, general appliances, all modern equipment, large stock supplies and parts. National Service hook up. Gross revenue 1943 over \$20,000—1944 between \$30,000 and \$35,000. Selling entire stock due to ill health. \$19,000 to handle. Box 1653, Air Conditioning & Refrigeration News.

2,363,434. REFRIGERATION. Ralph C. Osborn, North Canton, Ohio, assignor to The Hoover Co., North Canton, Ohio. Application June 25, 1941, Serial No. 399,636. 17 Claims. (Cl. 62-119.5.)



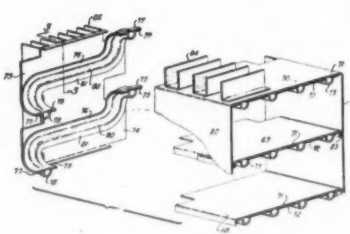
2. In a refrigerator; a cabinet structure having an insulated refrigerating chamber and a mechanism compartment extending below and along a vertical wall of said refrigerating chamber; an absorption refrigerating mechanism associated with said cabinet structure comprising an evaporator positioned in said chamber, an air cooled absorber positioned in said compartment below said evaporator, a condenser positioned along said vertical wall adjacent the top thereof, a boiler positioned in said compartment, a gas heat exchanger extending vertically along a wall of said chamber; a boiler flue extending vertically along said wall of said chamber in spaced relationship with said gas heat exchanger; a base frame in said compartment below said refrigerating chamber supporting said boiler, and the lower ends of said gas heat exchanger and said flue; and connections for said refrigerating mechanism constructed of heavy tubing; said apparatus being so constructed and arranged that said absorber, said condenser, and said evaporator are supported in their respective positions solely by said gas heat exchanger and said boiler flue.

2,363,446. REFRIGERATION. Arnold D. Siedle, Cleveland Heights, Ohio, assignor to The Hoover Co., North Canton, Ohio. Application June 25, 1941, Serial No. 399,639. 16 Claims. (Cl. 62-119.5.)



1. Refrigerating apparatus comprising an insulated refrigerating chamber structure, a mechanism chamber underlying said refrigerating chamber structure and having no greater horizontal dimensions, an absorption refrigerating mechanism associated with said structure including an evaporator in said refrigerating chamber, a condenser positioned on a vertical wall of said structure, and a generator and an absorber in said mechanism chamber, a sub frame arranged to support said condenser on said structure, and a second sub frame arranged to support said absorber and said generator in said mechanism compartment.

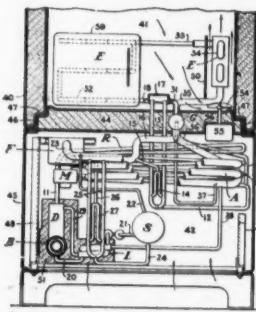
2,363,435. REFRIGERATION. Ralph C. Osborn, North Canton, Ohio, assignor to The Hoover Co., North Canton, Ohio. Application July 28, 1941, Serial No. 404,330. 8 Claims. (Cl. 62-126.)



1. A two-temperature evaporator for an absorption refrigerating apparatus of the type which utilizes an inert gas under pressure for blowing liquid refrigerant upwardly through the evaporator comprising, a sharp freezing chamber comprising a top horizontal wall, an upper horizontal ice tray shelf and a bottom horizontal wall forming a lower ice tray shelf, said upper wall, upper shelf and lower wall each comprising an upper flat plate and a lower plate with a depression formed in its upper surface and sealed in face to face relationship to

the upper plate so that the depression forms a continuous duct between the plates having an inlet and an outlet, said box cooling section comprising two vertically positioned plates having complementary depressions in one face thereof, sealed together in face to face relationship with the depressions facing each other so as to form a continuous duct between the plates having an inlet and an outlet, means for leading liquid refrigerant and an inert gas under pressure to the inlet of the duct in the lower wall, and conduit means connecting the outlet of the duct in the lower wall to the inlet of the duct in the upper shelf, the outlet of the duct in the upper wall and the outlet of the duct in the upper wall to the inlet of the duct in the box cooling section.

2,363,447. REFRIGERATION. Arnold D. Siedle, Cleveland Heights, Ohio, assignor to The Hoover Co., North Canton, Ohio. Application June 25, 1941, Serial No. 399,630. 30 Claims. (Cl. 62-119.5.)



1. In a refrigerator, a cabinet having an insulated food compartment and a mechanism chamber arranged for flow of cooling air therethrough and entirely positioned below said food compartment, an absorption refrigerating mechanism associated with said cabinet including an evaporator in said compartment, an air cooled condenser and an air cooled absorber in said chamber, a boiler assembly in said chamber, means connecting said absorber and said boiler assembly for circulation of absorption solution, means connecting said absorber and said evaporator for circulation of inert gas, and means for conducting refrigerant vapor from said boiler assembly to said condenser and for conducting refrigerant liquid from said condenser to said evaporator.

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Ranco freezer controls are engineered to meet the demand of frozen food cabinets for the most responsive and dependable control. This is assured by Ranco by the machining of parts to give quick free-acting response by inspection of each subassembly to insure dependable performance. Throughout, rugged construction insures long life even under the most demanding conditions. Specify RANCO for dependable freezer cold controls.

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For all types of Pressure and Temperature Controls—commercial and domestic—depend on the advice of your Ranco Jobber. He has the exact control you need, or can recommend a simple adaptation.

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Ranco Inc.

Heads G-E Range Sales



J. F. McBride

McBride Directs G-E Range Sales

(Concluded from Page 1, Column 2)

At the start of the war Mr. McBride returned to the publicity department in Schenectady and was assigned to the industrial divisions' advertising section. In March, 1943, he joined the aircraft instruction book section, and was in charge of that section from June 1 this year, to the present.

Tighter Credit Terms For Postwar Sales Urged by C.R.M.A.

(Concluded from Page 1, Column 4)

vegetable refrigerator, frozen food cabinet, or self-service fixture has top priority on his "want list."

In addition to the demand from established buyers, a considerable expansion of stores of the super-market type is expected, particularly in the medium volume class—\$200,000 to \$300,000 a year—and probably most of these will be located in outlying urban areas, reported the committee, which also expects war veterans to establish 75,000 to 100,000 new independent food stores after the war, in the light of experiences after World War I.

CRMA members were also informed that the Office of Price Administration is forming an advisory committee to assist the industry in obtaining relief from present price ceiling restrictions. CRMA men estimate that current production costs average 25% to 30% above prewar levels.

Two New Sections Of ASRE Formed

(Concluded from Page 1, Column 3)

still many schools of thought on the best design and sizes for home freezers, and on the technical aspects such as correct temperatures, and the like. The Society heard pleas from Prof. J. E. Nicholas of Penn State College and others for active participation in a program to establish some sort of standards for home freezers. (A more complete report of the technical sessions will be given in a later issue).

Expectations continue for a terrific market in home freezers, one company basing its plans on a potential of 7 million users.

Two new sections were admitted to the Society at its fortieth meeting—Seattle, Wash., and New Orleans. George Horne was elected to honorary membership at the meeting.

Spring meeting in 1945 will be held in June in Milwaukee, it was announced.

New officers of the Society are: President, J. F. Stone, manager of the refrigeration division of Johns-Manville Corp.; vice presidents, Charles S. Leopold, Philadelphia consulting engineer; and R. H. Money, chief refrigeration engineer of the Crosley Corp.; treasurer, John G. Bergdoll, Jr., chief engineer, York Corp.

Camera-fan Irving Alter of the Harry Alter Co. caught these groups in informal poses during the recent National Refrigeration Supply Jobbers Association convention in Chicago. On the left are Prof. Burgess Jennings, head of the department of mechanical engineering at Northwestern University, and also head of the Chicago section of A.S.R.E.; H. T. McDermott, who recently returned to his post as

secretary of the R.S.E.S. after many months of service with a U. S. Army Medical Detachment in the South Pacific; and Howard Hubbell of Brass & Copper Sales Co., who comes back to the industry after having received a discharge from the U. S. Navy with the rank of Lieutenant Commander. (Center) Some of the ladies present were Mrs. Robert Gennett, who operates Refrigeration Supplies Distribu-

tors of Birmingham, Ala., while her husband is serving in the armed forces; Mary Silvers, of the N.R.S.J.A. national office; and Mrs. Sterling Smith, wife of the manager of the Mills Industries refrigeration division; (right) A. B. Schellenberg, of Alco Valve Co., and president of R.E.M.A., seems to be spreading the gospel of industry cooperation as he talks to the jobber group.



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